MikroTik Nstreme Protocol

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General Information

Summary

The nstreme protocol is MikroTik proprietary wireless protocol created to improve point-to-point and point-to-multipoint wireless links. Nstreme2 works with a pair of wireless cards (Atheros AR5211 and AR5212 MAC chips only) - one for transmitting data and one for receiving.

Benefits of nstreme protocol:

* Client polling

* Very low protocol overhead per frame allowing super-high data rates

* No protocol limits on link distance

* No protocol speed degradation for long link distances

* dynamic protocol adjustment depending on traffic type and resource usage

Specifications

Packages required: *wireless*
License required: *level4*
Standards and Technologies: *nstreme*
Hardware usage: *one radio for nstreme; two radios for nstreme2*

Description

The nstreme protocol may be operated in three modes:

- **Point-to-Point mode** - controlled point-to-point mode with one radio on each side
- **Dual radio Point-to-Point mode (nstreme2)** - the protocol will use two radios on both sides simultaneously (one for transmitting data and one for receiving), allowing superfast point-to-point connection
- **Point-to-Multipoint** - controlled point-to-multipoint mode with client polling (like AP-controlled TokenRing)

nstreme settings

Home menu level: */interface wireless*

Property Description

mode (*ap-bridge | bridge | station | alignment-only | nstreme-dual-slave*; default: **station**) - operating mode:

- **ap-bridge** - the interface is operating as an Access Point
- **bridge** - the interface is operating as a bridge
- **station** - the interface is operating as a client
- **alignment-only** - this mode is used for positioning antennas (to get the best direction)
- **nstreme-dual-slave** - enslave the card into nstreme2 group

Notes

If wireless interfaces are put in **nstreme-dual-slave** mode, all configuration will take place in **/interface wireless nstreme-dual** submenu described further on. In that case, configuration made in this submenu will be ignored.

Nstreme Settings

Home menu level: */interface wireless nstreme*

Description

You can switch a wireless card to the nstreme mode. In that case the card will work only with nstreme clients.

Property Description

name (*name*) - reference name of the interface

enable-nstreme (yes | no; default: **no**) - whether to switch the card into the nstreme mode

framer-policy (*none | best-fit | exact-size | fast-frames*; default: **none**) - the method how to combine frames (like fast-frames setting in interface configuration). A number of frames may be combined

into one bigger one to reduce the amout of protocol overhead (and thus increase speed). The card are not waiting for frames, but in case a number packets are queued for transmitting, they can be combined. There are several methods of framing:

- **none** - do nothing special, do not combine packets
- **fast-frames** - use fast-frame mode of the radio card
- **best-fit** - put as much packets as possible in one frame, until the framer-limit limit is met, but do not fragment packets
- **exact-size** - put as much packets as possible in one frame, until the framer-limit limit is met, even if fragmentation will be needed (best performance)

framer-limit (*integer*; default: **3200**) - maximal frame size

Example

To enable the nstreme protocol on the **wlan1** radio with exact-size framing:

```
[admin@MikroTik] interface wireless nstreme> print
 0 name="wlan1" enable-nstreme=no framer-policy=none framer-limit=3200
[admin@MikroTik] interface wireless nstreme> set wlan1 enable-nstreme=yes \
\... framer-policy=exact-size
```

Nstreme2 Group Settings

Home menu level: */interface wireless nstreme-dual*

Description

Two radios in **nstreme-dual-slave** mode can be grouped together to make nstreme2 Point-to-Point connection

Property Description

name (*name*) - reference name of the interface

mtu (*integer*: 0..65536; default: **1500**) - Maximum Transmission Unit

mac-address (*MAC address*) - MAC address of the receiving wireless card in the set

arp (*disabled | enabled | proxy-arp | reply-only*; default: **enabled**) - Address Resolution Protocol setting

disable-running-check (yes | no) - whether the interface should always be treated as running even if there is no connection to a remote peer

tx-radio (*name*) - which radio should be used for transmitting frames

rx-radio (*name*) - which radio should be used for receiving frames

remote-mac (*MAC address*; default: **00:00:00:00:00:00**) - which MAC address to connect to (this would be the remote receiver card's MAC address)

tx-band - operating band of the transmitting radio

- **2.4GHz-B** - IEEE 802.11b
- **2.4GHz-G** - IEEE 802.11g

- **5GHz** - IEEE 802.11a up to 54 Mbit
- **5GHz-turbo** - IEEE 802.11a up to 108Mbit

rx-band - operating band of the receiving radio
- **2.4GHz-B** - IEEE 802.11b
- **2.4GHz-G** - IEEE 802.11g
- **5GHz** - IEEE 802.11a up to 54 Mbit
- **5GHz-turbo** - IEEE 802.11a up to 108Mbit

tx-frequency (*integer*; default: **5180**) - Frequency to use for transmitting frames

rx-frequency (*integer*; default: **5320**) - Frequency to use for receiving frames

rates-a/g (*multiple choice: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps*) - rates to be supported in 802.11a or 802.11g standard

rates-b (*multiple choice: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps*) - rates to be supported in 802.11b standard

framer-policy (*none | best-fit | exact-size*; default: **none**) - the method how to combine frames (like fast-frames setting in interface configuration). A number of frames may be combined into one bigger one to reduce the amout of protocol overhead (and thus increase speed). The card are not waiting for frames, but in case a number packets are queued for transmitting, they can be combined. There are several methods of framing:
- **none** - do nothing special, do not combine packets
- **best-fit** - put as much packets as possible in one frame, until the framer-limit limit is met, but do not fragment packets
- **exact-size** - put as much packets as possible in one frame, until the framer-limit limit is met, even if fragmentation will be needed (best performance)

framer-limit (*integer*; default: **4000**) - maximal frame size

Example

To enable the nstreme2 protocol on a router:

1. Having two Atheros AR5212 based cards which are not used for anything else, to group them into a nstreme interface, switch both of them into **nstreme-slave** mode:

```
[admin@MikroTik] interface wireless> print
Flags: X - disabled, R - running
 0    name="wlan1" mtu=1500 mac-address=00:0B:6B:31:02:4F arp=enabled
      disable-running-check=no interface-type=Atheros AR5212
      radio-name="000B6B31024F" mode=station ssid="MikroTik" frequency=5180
      band=5GHz scan-list=default-ism
      supported-rates-b=1Mbps,2Mbps,5.5Mbps,11Mbps
      supported-rates-a/g=6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,
                      54Mbps
      basic-rates-b=1Mbps basic-rates-a/g=6Mbps max-station-count=2007
      ack-timeout=dynamic tx-power=default noise-floor-threshold=default
      burst-time=disabled fast-frames=no dfs-mode=none antenna-mode=ant-a
      wds-mode=disabled wds-default-bridge=none
      update-stats-interval=disabled default-authentication=yes
      default-forwarding=yes hide-ssid=no 802.1x-mode=none

 1    name="wlan2" mtu=1500 mac-address=00:0B:6B:30:B4:A4 arp=enabled
      disable-running-check=no interface-type=Atheros AR5212
      radio-name="000B6B30B4A4" mode=station ssid="MikroTik" frequency=5180
```

```
        band=5GHz scan-list=default-ism
        supported-rates-b=1Mbps,2Mbps,5.5Mbps,11Mbps
        supported-rates-a/g=6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,
                       54Mbps
        basic-rates-b=1Mbps basic-rates-a/g=6Mbps max-station-count=2007
        ack-timeout=dynamic tx-power=default noise-floor-threshold=default
        burst-time=disabled fast-frames=no dfs-mode=none antenna-mode=ant-a
        wds-mode=disabled wds-default-bridge=none
        update-stats-interval=disabled default-authentication=yes
        default-forwarding=yes hide-ssid=no 802.1x-mode=none

[admin@MikroTik] interface wireless> set 0,1 mode=nstreme-dual-slave
```

2. Then add nstreme2 interface with exact-size framing:

```
[admin@MikroTik] interface wireless nstreme-dual> add \
\... framer-policy=exact-size
```

3. And configure which card will be receiving, and wich - transmitting

```
[admin@MikroTik] interface wireless nstreme-dual> print
Flags: X - disabled, R - running
 0 X  name="n-streme1" mtu=1500 mac-address=00:00:00:00:00:00 arp=enabled
       disable-running-check=no tx-radio=(unknown) rx-radio=(unknown)
       remote-mac=00:00:00:00:00:00 tx-band=5GHz tx-frequency=5180
       rates-b=1Mbps,2Mbps,5.5Mbps,11Mbps
       rates-a/g=6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,54Mbps
       rx-band=5GHz rx-frequency=5320 framer-policy=exact-size
       framer-limit=4000

[admin@MikroTik] interface wireless nstreme-dual> set 0 disabled=no \
\... tx-radio=wlan1 rx-radio=wlan2
[admin@MikroTik] interface wireless nstreme-dual>
```