

Wireless Lab

CSE 4616

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on

Implementation of Deterministic Backoff in NS3

Date: June 10 2023

Mechanism of Deterministic Backoff

The difference with random backoff is that, in deterministic backoff, when a packet is transmitted successfully without collision, a fixed value is chosen for the backoff and that value is used for the subsequent transmission. But if there is a collision, a random backoff is taken

Pseudo Code:

```
while the device is on do
   $r \leftarrow 0; k \leftarrow 0; k_c \leftarrow k;$ 
   $b \leftarrow \mathcal{U}[0, 2^k CW_{\min} - 1];$ 
  while there is a packet to transmit do
    repeat
      while  $B > 0$  do
        wait 1 slot;
         $B \leftarrow B - 1;$ 
      Attempt transmission of  $2^k$  packets;
      if collision then
         $r \leftarrow r + 1;$ 
         $k \leftarrow \min(k + 1, m);$ 
         $B \leftarrow \mathcal{U}[0, 2^k CW_{\min} - 1];$ 
      until  $(r = R)$  or success;
       $r \leftarrow 0;$ 
      if success then
         $B_d \leftarrow \lceil 2^k CW_{\min} / 2 \rceil - 1;$ 
         $B \leftarrow B_d;$ 
      else
        Discard  $2^{k_c}$  packets;
         $B \leftarrow \mathcal{U}[0, 2^k CW_{\min} - 1];$ 
       $k_c \leftarrow k;$ 
    Wait until there is a packet to transmit;
```

Here we can see,

When packet transmission is successful

$$B = B_d = [2^k CW_{\min} / 2] - 1$$

So, backoff value is fixed, and if transmission was not successful a random backoff is chosen