Retransmission-based Access Class Barring for RAN overload control in Machine Type Communications

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Outline

Aim

- **In order to alleviate the RAN overload,**
- We focus on the objective that can increase access success probability and relieve the access delays.
- **Accroding to traditional ACB factor is fixed.**
- We proposed an algorithm to make eNB be able to change ACB factor dynamically.

Background

- **Random Access Procedure**
  - when UE device is switched on or handover from on eNB to another.
  - will contend resource blocks with others.
  - Is classified into two type in LTE, contend based and contend free.

Background

- 4 step in random access procedure

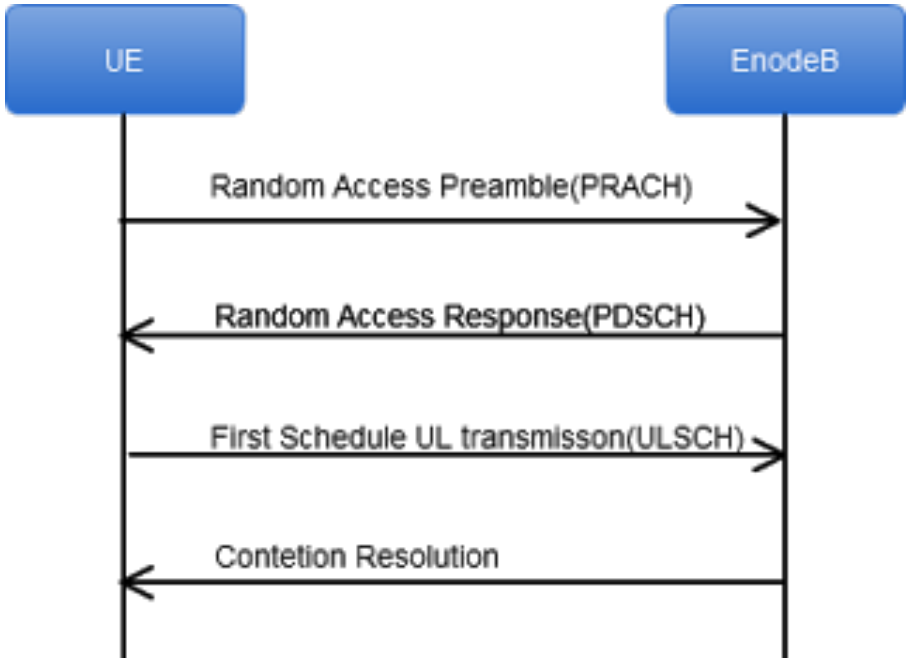

Figure: RAP

System model
Random Access Procedure

- Devices will receive info from SIB2
- Device will choose a preamble and increase preamble transmission
  - wait for RAR(Msg2)
  - if fail to receive RAR, it will wait for a backoff time to retry if the number of transmission is smaller than maximum
- Sending the connection request(Msg3)
- If successfully to transmit the preamble to eNB, it will finish the RAP

System model

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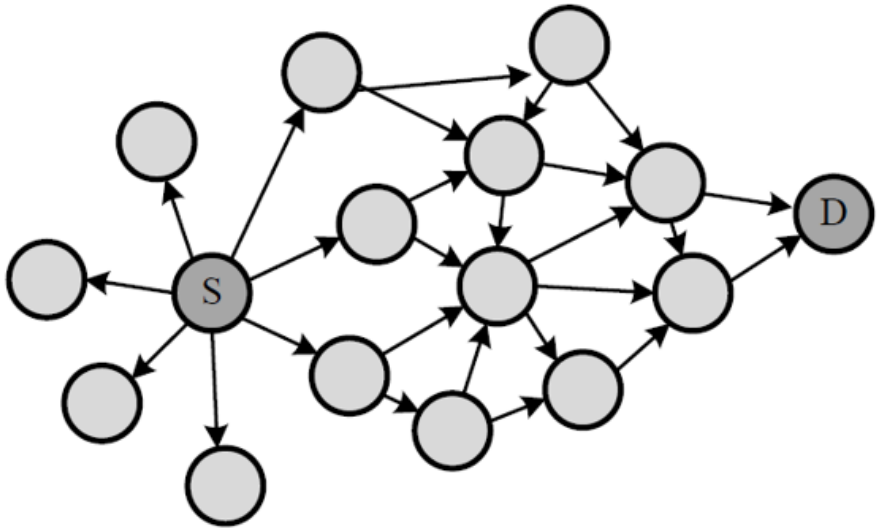

Figure: Some Figure Description

Result

Parameter	Value
Simulation Count	100 thousand
Area Width / Length	40.0 meter
eNB Intensity (λ_B)	0.01 m^{-2}
CeUE Intensity (λ_C)	0.15 m^{-2}
DeUE Intensity (λ_D)	0.15 m^{-2}
Path Loss Exponent (α)	4.0
eNB Power (P_B)	43.0 dBm
Maximum Medium Access Prob. $\tilde{p}$	0.9