

## Rate Information and the 802.11 MAC

- 802.11 MAC is designed to operate with exact rate information
- Rate information is used in several areas
  - Supported Rates element
    - Beacons
    - Probe Request/Response
    - Association/Reassociation
  - RXVECTOR, TXVECTOR
    - Duration calculation

## Rate Information and the 802.11 MAC

- Supported Rates element is used for
  - Announcing rates in a BSS (Beacon TX, Probe Response)
  - Selecting a BSS (Scanning, Joining)
  - Informing AP of Station capabilities (Association, Reassociation)
- This information does *not* need to be exact
  - All stations must have the same understanding of a value in the element
  - The value in the element can be considered a *label* for a rate

## Rate Information and the 802.11 MAC

- RXVECTOR contains the rate at which a frame is received
- TXVECTOR contains rate at which a frame is to be transmitted
  - This rate information is used to calculate the duration field in the MAC header
  - Must be accurate to make this calculation accurately

## Effect of Inexact Rate Information

- Inexact rate information in the calculation of duration
  - wastes valuable (usable) bandwidth when the representation of the rate is less than the actual rate
    - NAV does not expire until well after frame exchange completes
  - causes otherwise avoidable collisions when the representation of the rate is greater than the actual rate
    - NAV expires before frame exchange completes

## Effect of Inexact Rate Information

- Amount of wasted bandwidth or time vulnerable to collisions is proportional to the *percentage* error in the representation of the actual rate
- Large frames cause greatest waste
- Large frames are most vulnerable to collision