

September 1998

doc.: IEEE 802.11-98/316

Multirate is Broken

Anil K. Sanwalka and Tom Tsoulogiannis
Neesus Datacom Consultants

Submission

Slide 1

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Introduction

- The multirate mechanism allows implementations to be created that are not interoperable for the new high-speed PHYs.
- The concept is sound but some details need to be modified to provide the correct behaviour.
- How do we fix the standard?

Submission

Slide 2

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Scenario 1

- A BSS configured with 1, 2 and 5.5 Mb/s as rates in the BSS basic rate set.
- On receiving a 5.5 Mb/s frame an STA is supposed to check the PHY mandatory rates.
- PHY mandatory rates are not defined.
- This problem can be resolved by removing the reference to PHY mandatory rates.

Submission

Slide 3

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Scenario 2

- A BSS configured with 1 and 2 Mb/s as rates in the BSS basic rate set.
- On receiving a 1 Mb/s frame an STA is incorrectly required to transmit the control response frame at 2 Mb/s.
- This problem can be resolved by the response being sent at the highest rate in the BSS basic rate set that is less than or equal to the rate of the received frame.

Submission

Slide 4

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Scenario 3

- A BSS configured with 1, 2 and 5.5 Mb/s as rates in the BSS basic rate set.
- On receiving a 5.5 Mb/s frame an STA is required to respond with a 5.5 Mb/s control response frame.
- The BSS basic rate set definition requires that STAs be able to receive at all the rates in the set and transmit at one of the rates.
- Require that all STAs in a BSS be able to receive and transmit at all the rates in the BSS basic rate set.

Submission

Slide 5

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Scenario 4

- The definition of `aMPDUDurationFactor` in clause 10.4.3.2 specifies it as an integer.
- However, the value assigned it in clause 14.9 is 1.03125.
- This problem can be overcome easily by normalizing the value with an integer so that the effect of discarding a fractional component will be less than 1 μ s.

Submission

Slide 6

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Scenario 5

- No mechanism for an MLME on one STA to discover the receive rates supported by a remote STA.
- Information is needed to implement the unspecified rate switching mechanism.
- Possible Solutions
 - Use trial and error.
 - Add a service primitives to retrieve the receive capabilities of remote STAs.

Submission

Slide 7

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

Interoperability Problems?

- Incorrect definition of the BSS basic rate set.
- Differing interpretations of the rate of the control response frame.

Submission

Slide 8

Sanwalka, Tsoulogiannis, Neesus Datacom

September 1998

doc.: IEEE 802.11-98/316

How do we fix it?

- Apply for a new PAR.
- Issue a response to an interpretation request.
- Piggyback it to TGrev.

Submission

Slide 9

Sanwalka, Tsoulogiannis, Neesus Datacom