

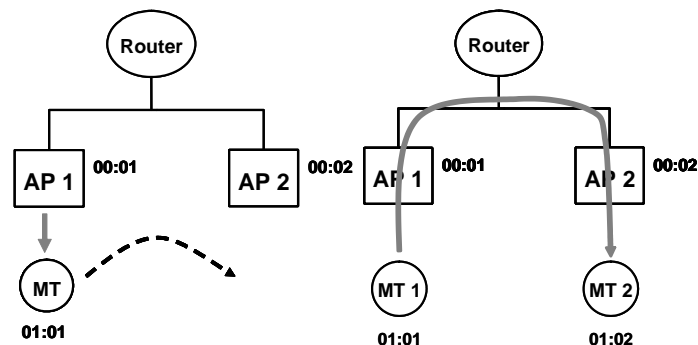


## Homework assignment 10: Wireless LANs

Due date: 2018-01-17

1. Compare the IEEE 802.11 infrastructure and ad hoc mode according to their architecture, services, and Medium Access Control (MAC) functions.
2. **Further IEEE 802.11 MAC and PHY control functions**

Assume the following IEEE 802.11-based scenarios: The left scenario shows a Mobile Terminal (MT) roaming from Access Point (AP) 1 to AP 2 *while* receiving data from AP 1. In the right scenario MT 1 transmits data to MT 2. Each number stands for the MAC address of the respective AP.



Provide for each scenario an Message Sequence Chart (MSC) and the entries of the Distribution System (DS) and address fields.

3. **Phy-Layer data rate of IEEE 802.11n and 11ac**

Use the following parameters to calculate the maximum data rate achievable at the PHY layer of 11n and 11ac. You might have to do some background checks.

- Number of data subcarriers
- Number of spatial streams

- Data bits per OFDM symbol, including code rate
- Duration of an OFDM symbol

Is it plausible to assume that this improvement of PHY data rate from 11n to 11ac is completely visible to and useful by an end user device? Is that the improvement you expect to see as application-level data rate?