Q10) 802.11k, 802.11v, and 802.11r work together to provide seamless roaming in enterprise networks by optimizing how and when a device moves from one access point (AP) to another, reducing delays and interruptions during roaming.

1. 802.11k (Radio Resource Management):

802.11k helps client devices make better roaming decisions by providing a list of nearby APs and their signal strengths. Instead of blindly scanning for APs, the client device knows the best options ahead of time, reducing roaming time.

2. 802.11v (Network-Assisted Roaming):

802.11v allows the network to suggest to the client when and where to roam. The AP can guide a client to move to a better AP based on network conditions (like load balancing, signal strength). This ensures clients are efficiently distributed across the network.

3. 802.11r (Fast BSS Transition):

802.11r speeds up the authentication process during roaming. Normally, re-authentication is slow, but 802.11r allows devices to use pre-authenticated credentials when moving between APs, leading to fast handoffs with minimal disruption, ideal for voice and video applications.