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## CALENDAR BASED DATA RATE-LIMITING MECHANISM IN WI-FI DEPLOYMENTS

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## ABSTRACT

As the day progress we all see wireless adoption and usage is ever increasing. With the advent of Wi-Fi 6, required data rates has further increased. It poses huge challenge to network administrator to keep the overall wireless network data usage in the expected limits considering the back-haul bandwidth limitations. Also, the required data rate limits are very turbulent in each location at a given Access Point (AP) at a given point-in-time. This brings in the need for mechanisms which can fast converge for the data rate requirements of wireless subscribers.

There are existing techniques which describe data rate-limiting methods to take care of backhaul bandwidth requirement. These techniques are slow, time consuming and hence there could be packet drops. These existing techniques will not be suitable in dynamic environment where large number of wireless clients joining or leaving at once, for example, company all-hands meetings, celebration, stadium deployments etc., The techniques presented herein propose method to enhance Wireless LAN (WLAN) data rate-limiting mechanism using the calendar details provided by the Mail Servers.

## DETAILED DESCRIPTION

As the day progress we all see wireless adoption and usage is ever increasing. With the advent of Wi-Fi 6, required data rates has further increased. It poses huge challenge to network administrator to keep the overall wireless network data usage in the expected limits considering the back-haul bandwidth limitations. Also, the required data rate limits are very turbulent in each location at a given Access Point (AP) at a given point-in-time. This brings in the need for mechanisms which can fast converge for the data rate requirements of wireless subscribers.

For example, few hundred people gathering at an event Hall, there will be sudden surge on data-rate to be allowed on the APs deployed in the event Hall. APs will not be able to handle the sudden increase in the demand with the traditional mechanisms. It will take lot of time to converge for the needs of the scenario and wireless service will be impacted. This is applicable to other deployments like stadium, movie theatre, classrooms to name a few.

There are techniques which describe data rate-limiting methods to take care of backhaul bandwidth requirement, wherein Wireless LAN Controller (WLC) will have a central logic to keep track of overall wireless network usage and allocations. Here, administrator must configure wireless data bandwidth less than or equal to backhaul bandwidth. WLC ensures total wireless bandwidth is well with-in the limits of administrator configured values. These techniques are slow, time consuming and hence there could be packet drops. These techniques will not be suitable in dynamic environment where large number of wireless clients joining or leaving at once, for example, company all-hands meetings, celebration, stadium deployments etc.,

The techniques presented herein propose method to enhance WLAN data rate-limiting mechanism using the calendar details provided by the Mail Servers. As per this method, WLC authenticates

with Mail Server and get the valid access token. Further, this access token is included in all calendar REST APIs provided by Mail Server. Also, APs in the deployments are named against their location details or explicitly configured with location tag. WLC will use these location details to identify the presence of APs in the meeting rooms of the floor/building.

Most of the meetings and gatherings are scheduled in the calendar and hence has the details of the location where the meeting will happen and how many people might be attending the meeting. WLC gets this meeting room information periodically using REST APIs provided by the Mail Server. WLC calculates bandwidth considering meeting room information (number of people attending, capacity of the room, number of APs in the meeting room). These above factors form the input for the mechanism on WLC to allocate the proportional data rates for APs in those locations without waiting to be explicit bandwidth request by the APs. Further, the newly allocated bandwidth will be pushed to all the APs. This method would enhance the allocation of required data rates almost immediately. Hence this will help to provide improved Wi-Fi service and enhanced customer experience.

Figure-1 depicts the state diagram for calendar-based data rate-limiting mechanism in wireless deployments.

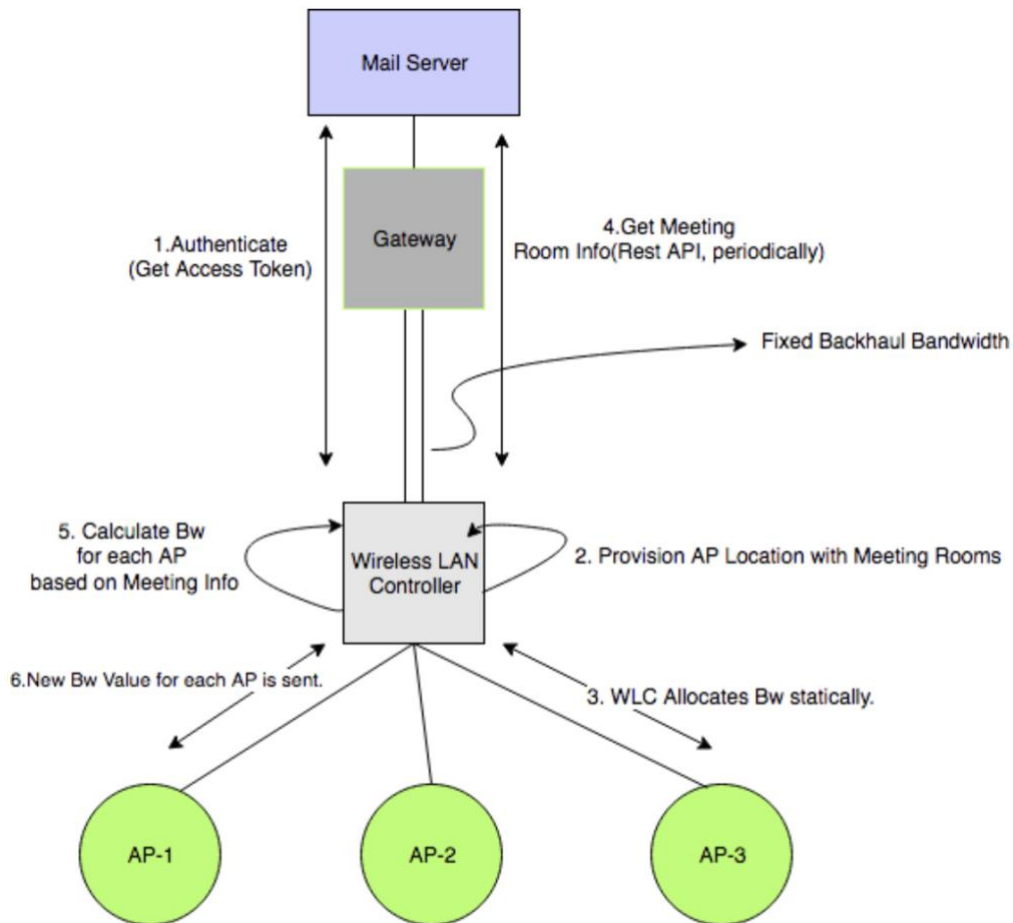


Figure-1

Figure-2 describe the sequence diagram for the calendar-based data rate-limiting mechanism in wireless deployments.

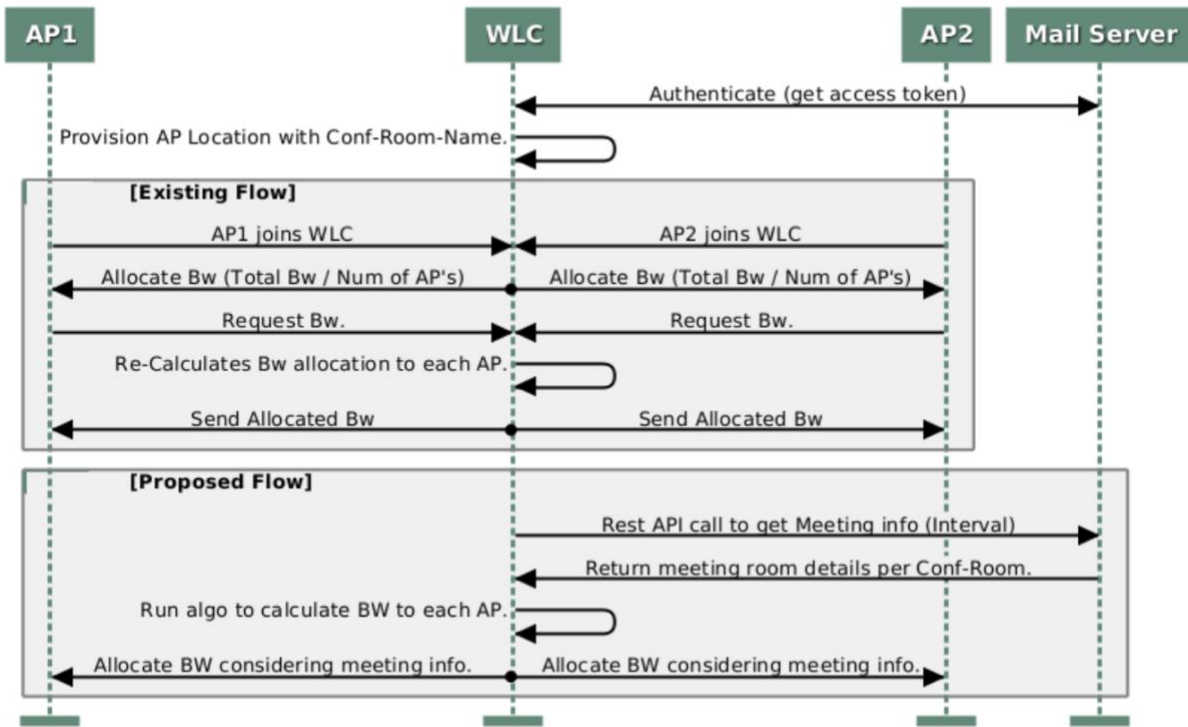


Figure-2

The techniques presented herein is very much applicable with Wi-Fi 6 as number of devices and data rates multi-folded with 11ax. With increased data rates, this method provides data rate limiting (throttling) mechanism to control the bandwidth usage in the deployments considering the limited backhaul bandwidth availability. In this method, data rate limiting is dynamically modifiable based on the requirement/usage. This method can be extended to support in SMB deployments such as stores using shop open and close timings from the Google Calendar.