IEEE P802.11  
Wireless LANs

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| Minutes 2025-01-13 AUTO TIG Meeting, Kobe | | | | |
| Date: 2025-01-14 | | | | |
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Abstract

This document contains the meeting minutes from the IEEE 802.11 Automotive Topic Interest Group (AUTO TIG) meeting in Kobe, Japan January 13, 2025.

Abbreviations:

Q: Question

A: Answer

C: Comment

Revision history:

R0: initial version

Automotive Topic Interest Group (AUTO TIG)   
Chair: Jim Lansford (FaraFir Consulting)

Vice Chair: Azin Neishaboori (General Motors), Jing Ma (Toyota)

**Meeting Agenda:**

The meeting agenda for AUTO 2025 January meeting is here: <https://mentor.ieee.org/802.11/dcn/24/11-24-2082-00-auto-agenda-for-automotive-tig-2025-january.pptx>

**Meeting Minutes:**

1. Chair called the meeting to order at 16:02 local Japan time and reviewed slides 1 through 11 of the agenda document.
2. Approval of the agenda
   1. Chair reviewed the draft agenda, no further edits were requested.
   2. **Motion: Approve the AUTO TIG agenda in document 11-24-2082r0.**
   3. **Moved: Richard Kennedy, Seconded: Harry Bims**
   4. **Result: Unanimous Consent**
3. Approval of the November 2024 AUTO TIG meeting minutes in <https://mentor.ieee.org/802.11/dcn/24/11-24-1950-00-auto-automotive-tig-meeting-minutes-for-november-11-2024.docx> .
   1. **Motion: Approve the AUTO TIG 2024 November minutes in document 11-24-1950r0.**
   2. **Moved: Jing Ma, Seconded: Richard Kennedy**
   3. **Result: Unanimous Consent**
4. Presentation by Javier Contreras Albesa (Cisco), <https://mentor.ieee.org/802.11/dcn/25/11-25-0070-00-auto-field-considerations-on-wifi-for-vehicles-8203.pptx> .
   1. C: IEEE 802.11ai (Fast Initial Authentication) provides authentication in two round trip frame exchanges. Its use should be considered.
   2. A: Passpoint enables international connectivity, but identification is key for authentication. Open roaming aids association, but credentials need secure identification for validation.
   3. Q: What was the speed of vehicles in the study?
   4. A: There is a huge variation in deployments. Have RF, RSSI and interference issues based on the design of the deployed networks. Every deployment is unique.
   5. Q: 802.1X connection was stated to be very long. What time durations are observed with Passpoint connections?
   6. A: Have ANQP delays, multiple seconds (thus Fast Transition is important). Total time to complete is long (seconds). Network delays can be present depending on RADIUS sever location and performance.
   7. Q: What about intra-ESS use cases?
   8. A: Yes, should be considered, might have better performance.
   9. C: Have done some experiments on this use case. Issue with seeing the AP Beacon, but then not being able to connect as the car moves.
   10. A: There are strategies involving rate adaptation algorithms that can help.
   11. Q: What are the expected benefits of the new features identified in the straw poll?
   12. A: Identify AP-assisted roaming for automotive. Need more data than 802.11k and 802.11v amendments currently provide.
   13. Q: What version of client devices were used – 11n? 11ac? 11b?
   14. A: Have seen all types of clients over the years.
5. **Straw Polls related to 11-25-0070:**
   1. **Do you agree on including infrastructure assisted client side roaming as use case study as part of this group? (GEO help, large scale, beyond 11k/v)?**
   2. **Yes: 73%No: 4% Abstain: 22%**
   3. **Do you agree on discussing inter-ESS IP handling as part of this group?**
   4. **Yes: 55%No: 7% Abstain: 39%**
   5. **Do you agree on discussing AP placement/RF solutions as part of this group?**
   6. **Yes: 33%No: 25% Abstain: 42%**
6. Presentation by Steve Arendt (Cablelabs), <https://mentor.ieee.org/802.11/dcn/25/11-25-0017-00-auto-mobile-wi-fi.pptx> .
   1. Q: Are you assuming an intra-ESS context for both control and data paths?
   2. A: Mostly assumed intra-ESS context; this is the easiest for management. Can span a large geography. Have some ideas on inter-ESS. Could have a cloud solution.
   3. Q: What is the main difference between the VBSS and BSS?
   4. A: VBSS refers to virtual BSSs.
   5. Q: Does the BSS need to operate in a single channel?
   6. A: Can use Channel Switch Announcement (CSA) to make the client think that a channel has changed. Can also use this to change bands: 2.4/5/6 GHz.
   7. Q: Slide 10 graph showed stable throughput. What are the assumptions on the user movement?
   8. A: Need to consider the “time to decide to transition”. In the initial demonstration, we used a drone that moved at 30km/hour. Works if you lower the decision-making duration time.
   9. Q: Using RSSI alone might not be sufficient for a client moving along a specific path. What is the recovery mechanism if the network decision is wrong?
   10. A: In testing, we used RSSI and other parameters based on the environment. You can also use machine learning with variations to deduce the direction of travel. Still a very lightweight set of calculations. Configure the APs with traditional static BSS roaming with client selection of AP. System performance overall is no worse than just the traditional way.
   11. C: Need to move BSS and related context, including sequence numbers. Might need to consider 11bn discussions ongoing related to BSS transition.
   12. A: We increase the sequence number, ensuring that it is monitonically increasing, no issue with the clients to date. Could improve the system to transfer the exact sequence number.
   13. Q: RSSI alone is not sufficient, open question on additional parameters. This looks like Mobile IP in the IETF context. Are packets dropped during the transfer? Consider controller versus AP partitioning of transition functions.
   14. A: Considered both controller and AP implementations. Create BSS on AP2, then delete BSS on AP1. Could implement carefully to result in no lost packets.
   15. Q: Slide 7 – Does client decide to move?
   16. A: No, the controller decides. Client is a passive participant in the BSS move.
   17. Q: Does this require a controller?
   18. A: Yes. Need an orchestration function somewhere.
   19. Q: Was real application data used in the prototype? Upper layers might automatically take care of the packet loss.
   20. A: Used iperf initially, and then deployed in homes for use. Have not taken a lot of care to prevent packet loss in the prototype. Could do this in a production system. As a user, did not see impact of the loss in real applications. Accept minor packet loss to maintain overall connectivity.
   21. Q: Can use of Virtual BSSs result in long term tracking of the client entity?
   22. A: Use randomized MAC addressed on the client. Possible to know the Virtual BSS transfers.
   23. C: Clients normally track the beacons. When BSS moves, source of Beacon frames changes.
   24. A: Experimented with ways to reduce the Beacon frame airtime. Tried unicast Beacon frames, changing the MCS of the Beacon frame. Multiple BSSIDs reduced the problem.
7. Presentation by Jing Ma, <https://mentor.ieee.org/802.11/dcn/25/11-25-0069-01-auto-follow-up-of-automotive-wlan-use-case-study.pptx> .
   1. C: 802.11bc features can be used to accomplish the data delivery more efficiently.
   2. A: Agree, we can look at this further, happy to work together on this.
   3. C: A make before break approach can also help; need to reduce the scanning time also.
   4. A: Could be considered.
8. One AUTO TIG meeting is planned for the March 2025 Plenary session. The Chair will send out a call for contributions.
9. Timeline review
   1. Our current target is to complete the AUTO TIG report by July 2025. Depending on the contributions, we might need to ask for more time.
10. Any other business: None.
11. Meeting adjourned at 17:55pm local Japan time.
12. Attendance: 95 attendees in the room, 145 attendees on Webex.

**References:**

Agenda: <https://mentor.ieee.org/802.11/dcn/24/11-24-2082-00-auto-agenda-for-automotive-tig-2025-january.pptx>

Prior (2024 November) meeting minutes: <https://mentor.ieee.org/802.11/dcn/24/11-24-1950-00-auto-automotive-tig-meeting-minutes-for-november-11-2024.docx>

Presentations:

<https://mentor.ieee.org/802.11/dcn/25/11-25-0070-00-auto-field-considerations-on-wifi-for-vehicles-8203.pptx>

<https://mentor.ieee.org/802.11/dcn/25/11-25-0017-00-auto-mobile-wi-fi.pptx>

<https://mentor.ieee.org/802.11/dcn/25/11-25-0069-01-auto-follow-up-of-automotive-wlan-use-case-study.pptx>