Newsletter of the North Orange County Computer Club

# range Bytes

**Volume 48 No 5** **May 5, 2024** **$1.50**

## NOCCC meetings for Sunday May 5, 2024

# MAIN MEETING -

**President Robert Strain will continue his presentation on how network addressing and TCP/IP works.**

**Jim Sanders will show some of the interesting features of the "Wayback Machine" AKA www.archive.org**

## Special Interest Groups (SIGs) & Main Meeting Schedule

**9:00 AM – 10:30 AM**

***Beginners Digital Photography .....Science 129***
Questions and Answers about Digital Photography

***Linux for Desktop Users.....Science 131***
Beginners' Questions about Linux

**10:30 AM – 12:00 PM Noon**

***3D Printing .....Science 127***
Questions and Answers about 3D printing

***Advanced Digital Photography... .....Science 129***
Questions and Answers about Digital Photography

***Linux Administration .....Science 131***
More topics about the Linux operating system

***Mobile Computing.....Science 109***
We discuss smart phones, tablets, laptops, operating systems and computer related news. **We need a new leader.**

**12:00 PM Noon – 1:00 PM**

***3D Printing..... Science 127***
Questions and Answers about 3D printing if requested.

***PIG SIG ..... Irvine Courtyard***
Bring your lunch. Consume it in the open-air benches in front of the Irvine Hall or join the group that goes to the student cafeteria. Talk about your computer(s) and life experiences.

**1:00 PM – 3:00 PM Main Meeting**

**..... Science 131**

**3:00 PM – 4:00 PM**

Board Meeting.....
***Science 131***

Verify your membership renewal information by checking your address label on the last page. If it is not right, let the treasurer know.

**Mark your calendars for these meeting dates**
**2024: May 5**, Jun ?

Coffee, cookies and donuts are available during the day in room 131 .
Food and drinks need to remain outside the Irvine Auditorium.

"Friends Helping Friends"
since April 1976

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**Special email addresses**
**Jim Sanders is: editor@noccc.org**
**membership@noccc.org**

**Our Website**
**WWW.NOCCC.ORG**

**Reminder:** Membership expiration dates are based on the date that you joined the club. **Example**, you joined or re-upped your membership in the club in October of 2023. That means that in October 2024 you should pay your membership dues. In the address label area of the Orange Bytes is your join month/ expiration month.

## Reprint Policy

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# Board of Directors

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## Editor's Report

### The Evolution of Wi-Fi Technology: From IEEE 802.11 to Wi-Fi 7

#### Introduction

Wi-Fi, a wireless local area network (WLAN) technology, has revolutionized how we communicate and access information. Since its introduction in 1997, the ongoing evolution of IEEE 802.11 Wi-Fi standards has led to faster data transmission rates, longer ranges, and more reliable and secure connections. Let's explore the journey of Wi-Fi from its inception to the present day.

#### Early Days: IEEE 802.11 (1997)

#### Wi-Fi 0

- In 1997, the pioneering IEEE 802.11 technical standard was published, enabling wireless data

transmission at up to 2 Mbps using a single radio frequency in the unlicensed 2.4 GHz radio spectrum.
Apple's AirPort wireless base station and iBook, launched in 1999, marked the major commercial breakthrough for Wi-Fi. Thanks to the IEEE 802.11b amendment, theoretical data rates of up to 11 Mbps became possible.

### Wi-Fi 2: IEEE 802.11a (1999)

- IEEE 802.11a introduced a new frequency band at 5 GHz, offering higher data rates (up to 54 Mbps) but with shorter range compared to Wi-Fi 1.

Despite its limitations, 802.11a laid the groundwork for future Wi-Fi standards.

### Wi-Fi 2a: IEEE 802.11b(1999)

802.11b products appeared on the market in **mid-1999**, since 802.11b is a direct extension of the DSSS (Direct-sequence spread spectrum) modulation technique defined in the original standard. The Apple iBook was the first mainstream computer sold with optional 802.11b networking.

### Wi-Fi 3: IEEE 802.11g (2003)

- Combining the best of both worlds, 802.11g operated in the 2.4 GHz band like Wi-Fi 1 but achieved data rates of up to 54 Mbps.

Backward compatibility with 802.11b devices made it widely adopted.

### Wi-Fi 4: IEEE 802.11n (2009)

- 802.11n brought significant improvements, supporting multiple antennas (MIMO) and achieving data rates up to 600 Mbps.

Dual-band operation (2.4 GHz and 5 GHz) became common, enhancing both speed and range.

### Wi-Fi 5: IEEE 802.11ac (2013)

- 802.11ac, also known as Wi-Fi 5, focused on the 5 GHz band.

It offered gigabit speeds (up to 1.3 Gbps) and improved efficiency through wider channels and beamforming.

### Wi-Fi 6: IEEE 802.11ax (2021)

- Wi-Fi 6 (802.11ax) is the most recent standard, designed for data-heavy applications.
- It operates in both 2.4 GHz and 5 GHz bands, achieving up to 9.6 Gbps.

Features include MU-MIMO (multi-user, multiple input, multiple output) a wireless technology that was introduced in the 802.11ac Wave 2 (Wi-Fi 5) standard. It allows a single access point (AP) to transmit data to multiple devices simultaneously. OFDMA (orthogonal frequency-division multiple access), a technology in Wi-Fi 6, improves wireless network performance by establishing independently modulating subcarriers within frequencies. This approach allows simultaneous transmissions to and from multiple clients. and improved security.

### Wi-Fi 7: IEEE P802.11be (Under Development)

- Wi-Fi 7 (IEEE P802.11be) is expected to be completed by 2024.
- It represents a major milestone with 4x faster data rates and twice the bandwidth compared to Wi-Fi 6.

Special-interest groups are exploring next-gen applications like AI, AR/VR, and battery-free IoT.

## Conclusion

The IEEE 802.11 series has transformed how billions of Wi-Fi devices connect globally. From humble beginnings to multi-gigabit speeds, Wi-Fi continues to evolve, enabling innovative applications and equitable internet access for all[1].

Remember, the next time you connect to Wi-Fi, you're part of a remarkable technological journey that began with those early 2 Mbps transmissions back in 1997!

## A LITTLE MORE HUMOR

This psychic is jailed for false prophecies, but because he is only 4'7" tall and extremely slender, he is able to slip under the bars and make his escape. Newspaper headline the next day?
"SMALL MEDIUM AT LARGE"

The psychic is really happy he escaped, and is back in business in a new location. This first customer, however, is a plainclothesman who is looking for him. Before the psychic could do anything about it, the plainclothesman hit the psychic with his fist in order to subdue him. The plainclothesman was reprimanded for: Striking a happy medium.

There was a movie director who wanted to create a movie about his 3 favorite composers: Wolfgang Amadeus Mozart, Johann Sebastian Bach and Ludwig van Beethoven. He always felt that composers were not portrayed manly enough and decided to change that once in for all. He invited some of the toughest actors to play the composers. He called Arnold Schwarzenegger, Jean-Claude Van Damme, and Sylvester Stallone. They all met and approved of his plan. Jean-Claude said he wanted to play Mozart. Stallone wanted to be Beethoven. And of course, Arnold said:
I'll be Bach

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**To All Members:**

**The line above your mailing address now shows your joindate. Please use your join month to choose when to renew your membership.**

# Dated Material – Please deliver ASAP

| Membership Level ($) | 1 Year | 3 Years |
|---|---|---|
| Individual Member ..... | 35 | 90 |
| Each Additional Family Member .... ..... | 15 | 40 |
| Full-Time* Enrolled College Student | 20 | |
| Enrolled High School Student | 15 | |
| *Minimum 12 Semester Hours | | |
| | | |
| Business Member + Ad (Business Card) | 25 | |
| Business Member + Ad (¼ Page, ½ Page) | 65, | 100 |
| Business Member + Ad (Full Page) | 175 | |
| Contributing Member | 75 | |
| Supporting Member | 100 | |
| Advocate Member | 250 | |
| Patron Member | 500 | |

Directions to the NOCCC meeting location


apcug An International Association of Technology & Computer User Groups

Enter CA-55 N (Costa Mesa Freeway) crossing Interstate 5 toward Anaheim/Riverside for 9 miles. *Notice freeway and street signs stating "Chapman University."* Exit toward E Chapman Ave. Turn right onto N Tustin St. Turn left onto E Walnut Ave.

1) Turn left past N. Center St. for the **best place to park** in the underground parking structure ( Lastinger under the sports field). Pay the small fee ($2) to park Ask members or help@noccc.org about parking details, restrictions, and our price break!

2) Turn left onto N Center St. On the right is the Hashinger Science Center, 346 N Center St. Orange California. Parking on the University side is free. Parking on the residential side is a city violation that may cost you a **tow away and a ticket!**