



Case Study

Highlights

- 12 Highly efficient Wi-Fi 6 Outdoor Access Points deployed
- Blanketed more than 25 acres of area with seamless Wi-Fi coverage
- Greater than 40k students visited the campus
- More than 16k students connected & experienced high-speed Wi-Fi during 2 days of the Fest
- Consumed over 100 GBs of data

Have you ever been to a college cultural festival where the Wi-Fi network was slow or unreliable, making it challenging to share photos or videos on social media? Imagine if you could attend a festival where you could access a high-speed Wi-Fi network throughout the campus, even in the outdoor areas, that could handle the data needs of thousands of students from colleges across the country. That's precisely what IO by HFCL achieved when they were entrusted with the responsibility of deploying a seamless Wi-Fi network for 'Odyssey'- the annual cultural festival of Indraprastha Institute of Information Technology, Delhi (IIITD).

Opportunity at Hand

Indraprastha Institute of Information Technology, Delhi (IIITD) is a state-level institute located in Okhla. As a high-ranked university spread over 25 acres and with a batch strength of more than 600 students, it is determined to ensure the best educational experience for all its students by providing them with the finest Network Infrastructure spanning the entire campus- Indoors and Outdoors.

The college has an existing indoor Wi-Fi Network with a backhaul of 1 Gbps that caters to the Administration, Classrooms, R&D Labs, and Hostel areas.

But the college lacks an efficient Outdoor Wi-Fi Network which is needed especially when the college receives high footfall during festivals, competitions, and other major events.

Every year the college organizes the “Odyssey” Cultural Festival that attracts students from across the country. With a plethora of cultural and financial events, including dance, music, theatre, literature, and art planned, the 2-day event sees a footfall of more than 40,000 students from various colleges.



Provide campus-wide high-speed, flawless Outdoor Wi-Fi to over 40,000 visitors coming in for the Odyssey college fest, held between 27-28th January 2023, by augmenting college's existing indoor Wi-Fi.

Solution Deployed



As a leading technology company, we were determined to identify the best Network architecture that will blanket the campus with high-speed seamless Wi-Fi Network to ensure a great user experience. After a thorough survey of the campus, the team identified three major areas inside the college premises to deploy our highly advanced Access Solution.

1

Robust, carrier-grade outdoor Wi-Fi 6 Access Points

2

Scalable Cloud Network Management System to remotely manage the entire network

3

Secure, fully integrated Captive Portal for onboarding and authenticating users connected to the network

Wi-Fi 6 Outdoor Access Points

At the heart of the challenge was identifying the optimal location to provide blanket coverage across the campus. We deployed Twelve high-performing wireless outdoor Wi-Fi 6 Access Points and highly specialized sector and omnidirectional antennas designed to deliver customized coverage areas, maximizing service quality while minimizing power consumption. The Access Points were deployed all around the campus: near the Amphitheatre where the cultural activities occur, the Sports ground where most of the competitions & other major events take place, and on the roads leading to the Lecture Halls and Hostels. The Access Points were powered using our robust & highly durable PoE injectors. We used the college's existing Network Infrastructure and connected our APs with the Ethernet Switches that provided the network with 1 Gbps Backhaul.



7 Dual Band 2x2:2 [Wi-Fi 6 Access Points](#) with high gain 8dBi Sectoral Antennas (70°).

5 Dual Band 2x2:2 [Wi-Fi 6 Access Points](#) with high gain 5dBi Omni directional Antennas.



High Data Rates

The concurrent dual band radio in the Access Point offers a combined peak data rate of 1.78 Gbps. Technologies like MU-MIMO, Transmit Beamforming and enhanced receiver sensitivity allowed the Access Points to effortlessly cater to the large number of visitors simultaneously at the college festival.

Seamless Transition

The Access Points support 802.11r- fast roaming and fast handover that help in seamless transition amongst the APs, as the user moves from one location to another, without any drop in the network connection, letting the users experience flawless connectivity in the entire campus.



EasyMesh Certified

The Access Points are EasyMesh certified which means that they can automatically form a wireless mesh, are interoperable with other Access Points, and can quickly be deployed with the existing network.

Highly Secure

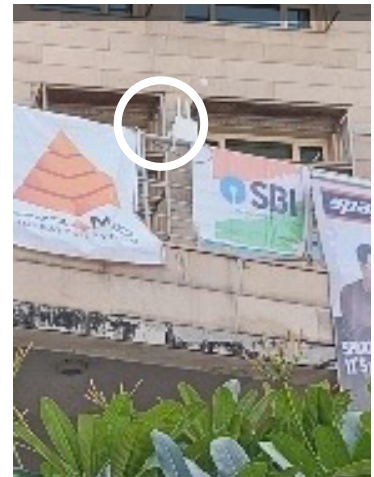
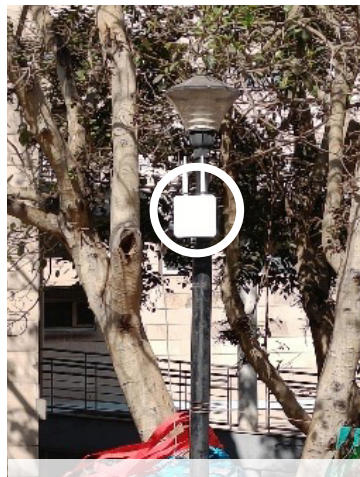
The Access Points come with WPA3 security- the latest Wi-Fi security standard, offering highly secure Network & shielding the students as well as the College Administration from unwanted cyber-attacks and hackers.





Our highly advanced Access Points are fully optimized to seamlessly deliver high speed Wi-Fi for data intensive applications like 4k live streaming, AR/VR, and AI. Students were able to seamlessly connect and use the Wi-Fi deployed by HFCL, letting the users at the fest enjoy flawless streaming, gaming, downloading & uploading their content without any hassle.

“Got a very nice response regarding the high-speed Wi-Fi being provided by HFCL team. The existing college Wi-Fi usually peaks at 20 Mbps that is insufficient for large number of students visiting the campus during the Fest. With HFCL’s Wi-Fi, the students were able to experience flawless Broadband Internet with data rates of more than 500 Mbps. The students were extremely satisfied as they were able to easily access their social media accounts, do live streaming and use it for multiple other things like video calling and gaming.”
Neev, Event Head, IIT Delhi.”



Cloud Network Management System (cNMS)

A unified dashboard enabled by our highly intuitive, scalable, and customizable Cloud Network Management System (cNMS)- iCON, provided visibility and control over the entire network. The iCON let the IT team manage the entire Wi-Fi network without having the hassle of being physically present at the location.

1 Efficient & Flexible Networks

The cNMS provides the flexibility to distribute the network, allocate varying bandwidths, manage, track, troubleshoot, configure, communicate, and enforce policies on all Access Points in the network.

3 Smart Network

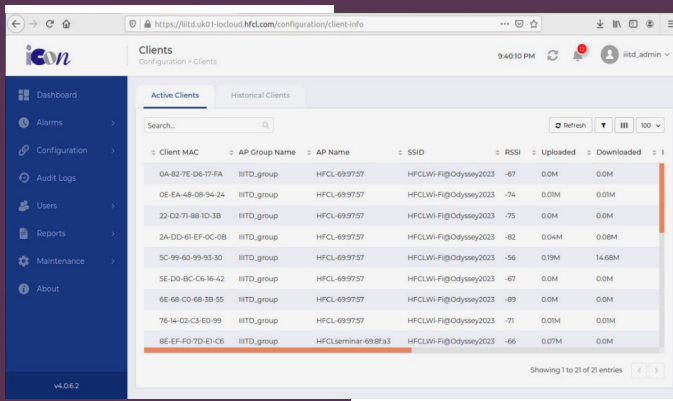
The controller has in-built analytics and reporting capabilities to gain insight into usage patterns.

2 Reduced complexity

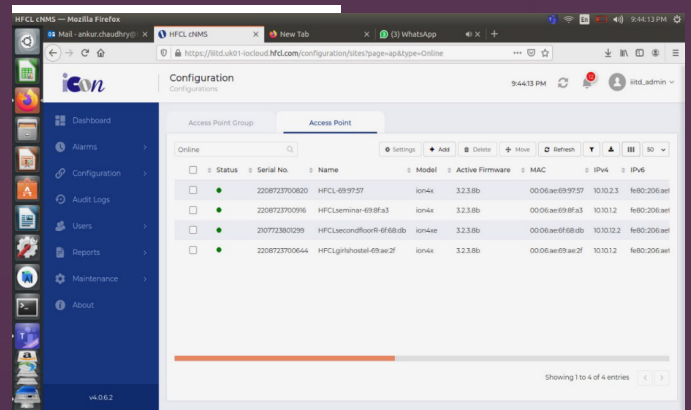
The end-to-end solution, which is self-provisioning, self-optimizing, and self-healing, allows for effortless deployment and management without the need for specialized training or dedicated personnel.

4 Maintain Network Security

Through our Cloud Network Management System (cNMS), we were able to have complete overview of the network deployed at the campus, block certain inappropriate sites, control the bandwidth usage, put in place appropriate security checks, and ensure that users experience impeccable Wi-Fi wherever they go.

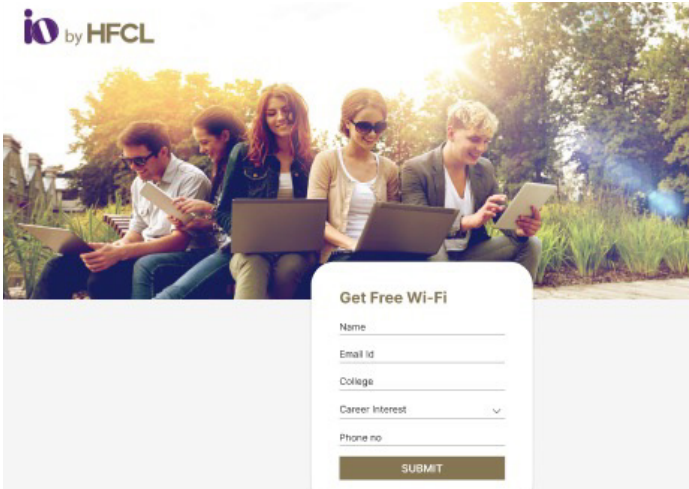


Client MAC	AP Group Name	AP Name	SSID	RSSI	Uploaded	Downloaded
DA-82-7E-D6-17-FA	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-67	0.0M	0.0M
0E-EA-48-08-94-24	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-74	0.0M	0.0M
22-C2-71-88-1D-38	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-75	0.0M	0.0M
2A-DD-61-EF-0C-0B	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-82	0.04M	0.08M
3C-99-60-99-93-30	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-56	0.19M	14.68M
5E-00-BC-C6-16-42	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-67	0.0M	0.0M
E6-68-C0-68-3B-55	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-89	0.0M	0.0M
76-14-02-C3-E2-99	IIITD_group	HFCL-69-97-57	HFCLWi-Fi@Odyssey2023	-71	0.0M	0.0M
8E-EF-F0-7D-E1-C6	IIITD_group	HFCLLeimmar-69-97-57	HFCLWi-Fi@Odyssey2023	-66	0.07M	0.0M

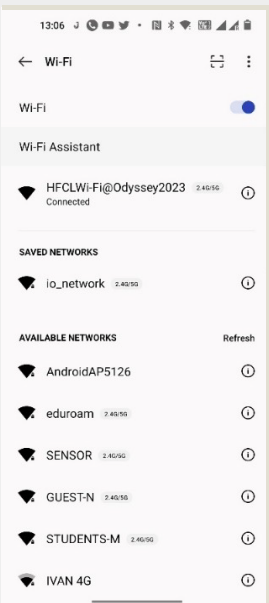


Status	Serial No.	Name	Model	Active Firmware	MAC	IPv4	IPv6
Online	2208723700830	HFCL-69-97-57	ion4x	3.2.3.8b	00:06:ae:69:97:57	10.10.2.3	fe80:206:ae...
Online	2208723700916	HFCLLeimmar-69-97-57	ion4x	3.2.3.8b	00:06:ae:69:97:57	10.10.2.2	fe80:206:ae...
Online	220772380299	HFCLLeimmar-69-97-57	ion4x	3.2.3.8b	00:06:ae:69:97:57	10.10.2.2	fe80:206:ae...
Online	2208723700644	HFCLLeimmar-69-97-57	ion4x	3.2.3.8b	00:06:ae:69:97:57	10.10.2.2	fe80:206:ae...

Captive Portal



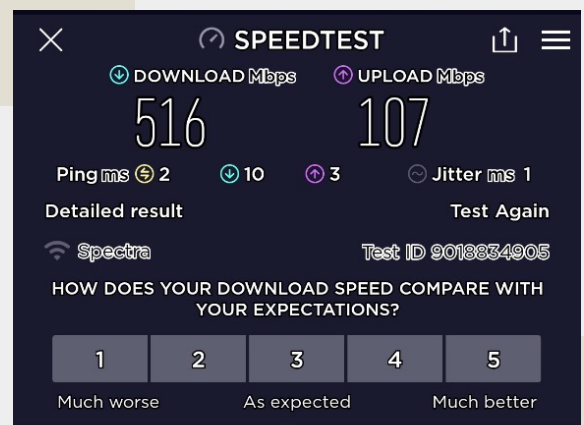
We created a highly interactive, secure and fully integrated Captive Portal for onboarding and authenticating credentials of users connecting to our Wi-Fi network. To let the users connect to our high speed Wi-Fi network, we created a separate SSID- “HFCL-Wi-Fi@Odyssey2023”. The users were asked to enter their details which were then validated through the OTP that was sent to their mobile phones.



This prevented unauthorized use of the Wi-Fi network from unwarranted sources. Moreover, we ensured that the captive portal is easily accessible and quick to load, thereby guaranteeing great user experience.



In addition to that, the session time was limited to 45mins for each login, ensuring safety of the entire network. The entire Wi-Fi network was seamlessly deployed and configured and provided high bandwidth of up to 500 Mbps to the visitors.





Challenges Faced During Deployment

Challenge 1

The entire college campus receives only 1 Gbps backhaul. This backhaul was being utilized by the College Administration buildings, libraries, laboratories, and college hostel buildings. This limited amount of backhaul that could be used for the outdoor Wi-Fi network.

Solution

We deployed EasyMesh certified Outdoor Wi-Fi 6 Access Points throughout the campus. This meant that the Access Points formed a complete mesh in the entire campus, leaving no Wi-Fi dead zones, thereby ensuring great user experience.

Challenge 2

We were tasked with the challenge of deploying Wi-Fi network in an open ground that spanned over 100m, had no backhaul and had no provision of mounting poles where we could deploy our Access Points.

Solution

To overcome this challenge, we deployed Wi-Fi 6 Access Points on the side road that runs parallel to the ground. We utilized our high gain 70° Sector Antennas with 8dBi Antenna gain and 30 dBm Transmit Power to direct the Wi-Fi signals towards the ground, thereby ensuring ubiquitous coverage.

Our achievements

We received **tremendous response** to our Wi-Fi Access Solution deployed at the IIT Delhi campus.

- We were able to provide secure & comprehensive Wi-Fi coverage to the entire outdoor campus area and provide over **500 Mbps** of flawless bandwidth.
- During the two days of the Fest, our Network was connected **>16,000 times** and more than **100 GB of data** was consumed.

Through our highly robust, carrier grade end-to-end Network solution, we were able to showcase our technological prowess in enabling pervasive Wi-Fi coverage for large universities like IIT Delhi.

“ Thank you HFCL for the providing us with an immaculate Wi-Fi solution to cover our entire campus during the two days of the Odyssey Fest. It was commendable to see how HFCL team was able to knit together the entire solution and seamlessly integrate their Wi-Fi Access Points with our existing network infrastructure and provide high speed Wi-Fi Access to over Forty thousand students. We were extremely pleased with the performance of the network as it helped us address a major problem of the absence of an efficient outdoor Wi-Fi network especially when the college receives such high footfall. HFCL’s Wi-Fi solution was truly helpful in making the Odyssey Festival a grand success”
IT Department, IIT Delhi.”

Wi-Fi for Education Sector: IO Advantage

With the advent of smart classrooms, the ability to collaborate on projects remotely, and introduction of content-rich applications made possible by the XR technology, Wi-Fi has become indispensable for modern education. To keep up with the "e-age" of learning, institutions require a reliable and simple-to-manage network that can deliver steady and quick internet access regardless of the network's load.

IO by HFCL offers advanced, robust and highly customizable Access Solutions (consisting of [Wi-Fi 6 Access Points](#), [high-capacity Unlicensed Band Radios](#), [Fully Managed Switches](#) and [Cloud Network Management System](#) to control and manage the entire network) that will help you upgrade your institution into an agile, secure, and connected space. Our solutions are flexible, easy to deploy & manage, and truly scalable to very high-density requirements.

- Secure wireless network for students and faculty to share information.
- Enables seamless online/ virtual operations ranging from classwork and exams to hosting guest lectures.
- Monitor and restrict content access for students.
- Campus-wide wireless network for students and staff to access resources remotely.
- Unmatched performance in high-density wireless environment
Best price to performance ratio