

## IEEE SA P2872

# Interoperable and Secure Wireless Local Area Network (WLAN) Infrastructure and Architecture (ISAWANI)

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# Summary

- PAR (Project Authorization Request) submitted - 24.01.2020
- PAR Approved - 04.03.2020
- Expected date of submission of standard - Jan 2023
- Expected date of Completion of standard - Aug 2023
- PAR Expiry- 31.12.2024
- Website
  - <https://standards.ieee.org/project/2872.html>
  - <https://sagroups.ieee.org/2872/>
- Total meetings conducted - 7
- Next meeting - 12.05.2021
- Mode of meeting - Virtual through Webex (monthly)
- Contribution/presentation :
  - C-DOT - WANI V1.0 Framework
  - C-DOT - WANI Token flow
  - WBA - WRIX, OpenRoaming, WBA IDs
  - NTIPRIT - Centralized Architecture for Public Wi-Fi Proliferation (CAWP)
- Current activity - defining focus areas and forming subgroups

# Scope of proposed standard

This standard specifies an architecture for an interoperable and secure public WLAN network infrastructure to provide seamless connectivity for users of IEEE 802.11 networks. The network infrastructure shall consist of IEEE 802.11 Wireless Access Points (WAPs) of different makes or models and from different vendors, backhaul connectivity provided by different service providers, authentication and policy infrastructures, and services (such as voice, data, and video) offered by different application service providers through subscription plans. The network infrastructure elements shall interwork with each other in a secure manner, and the infrastructure shall support discovery and inclusion of compliant WAPs to provide a seamless service for its subscribers.

## Need of the project

WLANs based on IEEE 802.11 standards are scalable and affordable technologies to provide connectivity. Due to their operation in unlicensed spectrum and their low cost, scalable architecture, backward compatibility, their richer user device ecosystem, among other attributes, countries are expanding their public WLAN infrastructures to proliferate broadband and expedite the bringing of citizens to the digital economy.

Countries such as India have defined a goal of having 5 million Public WLAN deployed by 2020 and 10 million by 2022. There is a pressing need of a well defined standard which can be adopted to deploy interoperable and secure Public WLAN Infrastructure for a seamless user experience.

## Users



- Users in Urban area
- Users in Rural area
- Area with no Cellular Coverage
- Area with only Wi-Fi Coverage
- Usage pattern
- Multiple onboarding mechanism

## Device



- Only Wi-Fi support
- Wi-Fi + Cellular Support
- Old/legacy device
- New device (EAP-SIM support)
- Sensors
- Surveillance devices
- Connected Vehicle etc.

## Wi-Fi Network



- Legacy Access Point
- Access Point with HS 2.0 Support
- Wi-Fi AP + internet backhaul
- Wi-Fi network with Captive portal + AAA
- Wi-Fi network with CP + AAA + Telco core
- Wi-Fi standalone network
- Wi-Fi roaming enabled network
- Hybrid roaming network

## Players



- TSP, ISP, VNO etc.
- Aggregators who has subscribers in villages or Tier III or IV cities
- Neutral host
- Wi-Fi APP provider
- Authentication infrastructure provider
- Roaming Hub/Clearing house
- PKI (Public Key Infrastructure)

## Public Agencies



- Lawful Agencies
- Smart City Authority
- Government/State agencies
- Data Analytics Agencies
- Disaster Authority etc.

## Applications



- General Internet (voice, data & video)
- Mobile Offload
- Public Utility
- Emergency Alerts
- Communication during disaster
- Connectivity infrastructure for Smart City (IoT, Connected Vehicle etc.)
- Wi-Fi Calling

## Deployment



- Railway stations
- Metro stations
- Village centres
- Bus Stands
- Malls
- Airports
- Tea shops
- Nook & Corner shops
- City centres
- Markets
- Community Centres etc.

## Wi-Fi Plan



- Free
  - Limited
  - Public Utility
- Paid
  - Prepaid
    - Voucher
    - Prepaid SIM (TSP)
  - Postpaid
    - Postpaid SIM (TSP)
    - Postpaid (ISP/Aggregator)

# Requirement

- Public Wi-Fi architecture shall take care of needs of all the players participating in the ecosystem.
- It shall allow users present in urban as well as rural areas to onboard the Public Wi-Fi with ease.
- The architecture shall not depend on the specific capability of User device as well as Access point and core elements. Legacy devices shall also seamlessly work.
- Multiple subscription plans shall be supported in the architecture to meet different usage need.
- It shall allow multiple players to interop securely.
- It shall allow smaller service providers to easily plug into the Public Wi-Fi infrastructure and provide seamless service to its subscribers and interop with bigger players such as TSPs and ISPs.
- It shall enable migration of existing Wi-Fi infrastructures to Public Wi-Fi infrastructure.
- It shall provide a single window view into the Public Wi-Fi network.

# Focus areas

- **Interoperable of multiple players to operate in the ecosystem**
  - Application provider
  - Access point provider
  - Bandwidth provider
  - Wi-Fi Core network provider
  - Central Database
- **Dependency of architecture on specific capability of**
  - User device
  - Wi-Fi Access Point
  - Wi-Fi core network
- **Identity of User in the network**
  - Unique Username
  - MAC ID of the User device
  - Certificates
- **Identity of multiple players in the ecosystem**
- **Security**
  - Wi-Fi layer security
  - Application layer security
  - Secure data exchange among multiple players
- **User Charging**
  - Voucher based data pack
  - Wallet based settlement
- **Universal Roaming**
  - Application provider centric Roaming
  - Wi-Fi provider centric Roaming
- **Settlement**
  - Commercial Settlement among all the players in the ecosystem
- **Lawful Interception Requirements**
- **Applications**

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Thank You