

HCL SMARTWiFi Platform

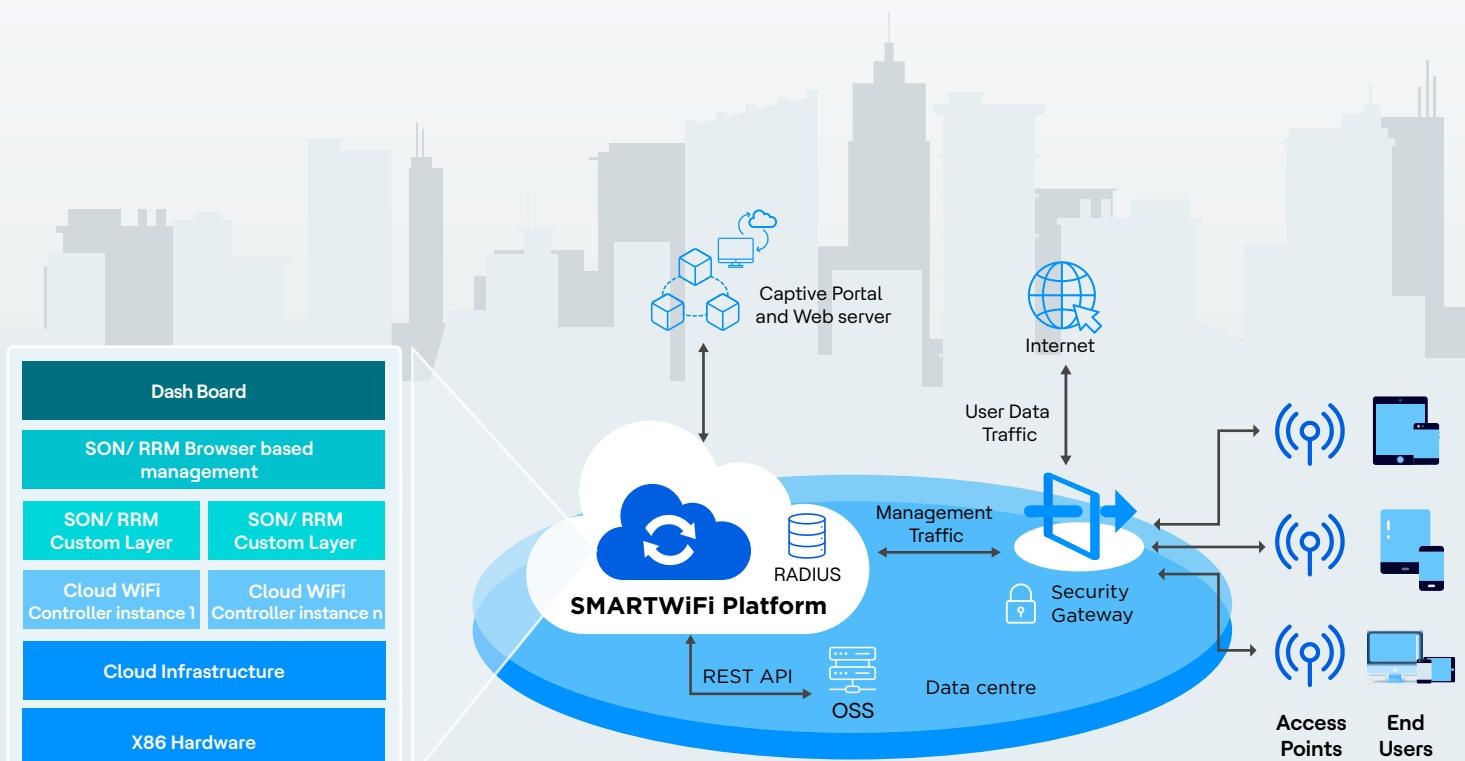
Cost effective, secure WiFi platform for centrally managed networks



HCL SMARTWiFi is a cloud-native, containerized secure WiFi network management platform for use by communication service providers (CSP) and managed service providers (MSP). HCL SMARTWiFi is ideal for large scale WiFi deployments that support various devices while remaining safe, secure, and consistent. Using open technologies, SMARTWiFi centrally manages access points (AP) for WiFi deployments across multiple sites to improve performance for WLAN networks. The result is an optimized user experience with improved connectivity and simplified management.

HCL SMARTWiFi Platform offers:

- Powerful and intuitive cloud-based AP management that eliminates the complexity of on-premises wireless controller hardware
- Advanced features such as radio resource management, band steering, and load balancing to improve network performance
- Lower total cost of ownership (TCO) than traditional offerings with a 40-60% savings based on volume and choice of access points



Wi-Fi Controller Architecture

| Cost effective and high performance network management without compromising security

HCL SMARTWiFi meets high user expectations by providing exceptional security and support. Support for WPA3 with industry-leading encryption and authentication methods means worry-free access. Rogue AP detection detects any access points that may be spoofing the SSID. Seamless updates and alarms can be scheduled or delivered on demand, supporting a secure experience without interruption.

| Flexible and scalable solution supports WiFi 6

HCL SMARTWiFi supports management of the latest WiFi 6 (802.11ax) access points. Access points with all previous standards and protocols such as 802.11a/b/g/n/ac are also securely supported, which enables your network to address a variety of use cases.

Business Benefits

- Built on a scalable containerized platform to accommodate growth
- Flexibility to deploy WiFi 6 solutions in private or public cloud
- Lowers TCO by 40-60%
- Intuitive dashboard with integrated cloud management and control function
- Cloud-based policy management for secure access point configuration
- Product architecture integrates easily with Service Provider's Systems (OSS/BSS)
- Rapid deployment with zero touch provisioning and plug-and-play capability

| Key Features

Access Point Management

- Bulk access point configuration
- Powerful dashboard monitors the real-time health of access points and traffic path controller to AP
- Role-based administration to configure multiple user accounts
- Seamless switch over to Trusted Wireless Access Gateway (TWAG) in case of connection failure

Reporting and Analytics

- Near real-time data reporting
- Actionable insights using network traffic data segmented by client and AP
- Location analytics measure visitor's bandwidth, visit length, and repeat visit rate over time
- Extensive data storage capabilities to store streaming data

Simple and Secure

- Supports WPA3
- Industry-leading encryption and authentication methods
- Rogue AP detection protects network
- Scheduled or demand based seamless upgrades
- Generate and manage pro-active alarms for scheduled and unscheduled alerts

Integration and Support

- Communicate with OSS/BSS and other third-party components (REST API, RPC, and https)
- Dual-stack support for IPv4 and IPv6 connectivity capabilities
- Hotspot 2.0 enables seamless roaming
- Automated PPPoE, enabling one-time login via single authorizing DSL service

| Specifications

Radio Features and Wi-Fi Standards	802.11ax, 802.11a/b/g/n and 802.11ac Wave II
	802.11d, 11k, 11m, 11r, 11u, 11v, 11i, 11i, 11e, 11h, 11w
	Compliance with all WiFi standards
	HOTSPOT 2.0
	Beamforming with Multiuser Multiple Input Multiple Output (MU-MIMO)
	Fast transition

Security	WPA3 based client authentication
	All existing Wi-Fi standards including Wi-Fi-6
	EoGRE tunnel
	IPSec tunnel between AP and WLC
	Date Encapsulation, Encryption
	RADIUS, AAA support
	WIPS methodologies
	Rogue AP Detection2
	Device classification
	802.1x authentication
	ACL configuration
	Client Exclusion
	SSH to the AP
	Client monitoring
PSK, PKI, CMPv2, x.509	

Enhanced Network Capabilities	DHCPv6
	Multiple interface vlan for WLAN
	Local Breakout (LBO) /Offload, PnP
	Zero touch provisioning with support for at least 32 SSIDs
	Point-to-Point Protocol over Ethernet (PPPoE)
	WLAN-VLAN mapping
	Ethernet over GRE (EoGRE) support
	Per SSID bandwidth control/per user

| Specifications

Troubleshooting	Centralized mechanism troubleshooting
	Constant monitoring of APs and other components in the topology
	Health check for APs, tunnel and other network components
	Packet Capture capabilities
	Log retention and analysis
	Cut through access to AP from management Web GUI
	SSH capabilities through controller
	On demand Speed test execution through controller
	AP, clients' stats collection based on NOC request
	Template Push from controller to AP for enabling debug mode

| Dashboards

Network Dashboard	Total number of APs supported by WLC
	AP view by location
	Data consumption in AP, SSID views
	Data usage trend
Client Dashboard	Total number of clients in the deployment
	Clients' classification by
	<ul style="list-style-type: none">• Data consumption
	<ul style="list-style-type: none">• Signal Strength
	<ul style="list-style-type: none">• Data rate
	<ul style="list-style-type: none">• Capabilities (11n, 11ac, 11ax)
<ul style="list-style-type: none">• Failed clients, location list of failed clients	

| Centralized SON, RRM

Centralized SON (Self- Organizing Network) and RRM (Radio Resource Management)	Automatic Channel and Bandwidth Selection, Interference Detection and Resolution by WLC
	Dynamically balances network load by distributing mobile stations among or across APs or Multi-AP RF groups.
	Periodic Wi-Fi Channel and Bandwidth Optimization
	Centralized Transmission Power Control (TPC)
	Band Steering (Effective utilization of dual bands)
	AirTime Fairness (dynamic distribution of air-time across clients, based on various factors)
	Airtime configuration for each SSID, Client based on MAC address and SSID groups
	Radio hole coverage
	802.11v BSS Transition Management (BTM)
	Optimizing Transmit power of each AP to maximize the coverage and minimize co-channel interference.
	Dynamic Channel Allocation (DCA)

| Analytics

Analytics	Stores the streaming data from heterogeneous sources in Data lake.
	Time series analysis
	High availability
	Works on JSON format
	Scalability by adding compute and/or storage to clusters
	Accommodates Petabytes of data with low latency
	Easily maintainable and reusable for any futuristic analytics expansion.
	Performs analytics of AP, Client, Performance, Security and compliance, client journey and connectivity

| Specifications

Platform	Any SoC/Wi-Fi chipset can be supported through 'OpenWrt' framework
	Container based WLC
	WLC can be placed in Private Data Center or public Cloud
	OSS and other service applications can be attached through REST APIs
	Leverages Kubernetes High Availability features
	Has a highly available database
	Seamless switch over to secondary TWAG/SaMOG, Security Gateway, Staging Servers
	Open source
	Based on Open technologies.
	No constraints of proprietary, tightly coupled and licensed SW
	Roaming in 2-3 msec
	WLC connectivity in less than 30 sec
	50 concurrent users per AP4
	Auto scalable WLC instances and Data Lake w/o down time

Network Management	Bulk Access Point provisioning
	Bulk Access Point configuration
	AP Reports
	AP WiFi Coverage visualization
	Role-based administration to configure multiple user accounts
	Multi-tenancy support
	LAN, WAN configuration
	Giga bit, 2.5 Giga bit backbone
	SSID, VLAN, ACL are configured by WLC
	Bridge, NAT, IPv6 PD are supported
	AP location mapping
	Client location tracking
	Receive syslog data from APs and stores it in the data lake
	Coverage hole detection ³
	Fault/Performance Management
	Fast Roaming

| Specifications

Network Management	Adaptive channel selection, based on interference conditions
	Auto SW Remote upgrade feature
	Monitors the status and alarms of the AP & configuration of APs using templates
	EoGRE support
	LBO/Offload based on deployment
	Zero touch PnP
	Multiple interface VLANs for WLAN
	32 SSIDs support per AP
	WLAN-VLAN mapping
	Creates graphs, stores status of APs and alarms
	Receives performance statistics from the APs and stores the data in the data lake.
	Live upgrade with zero downtime
	Alert on FW upgrade for Home users

Plug-in Support	REST API, RPC, https support for communicating with third party components and applications
	OSS Integration for Fault, Performance integration
	Support for Prometheus Metrics to monitor WLC health
	Support for ELK (Elastic-Search, Logstash, Kibana) integration
	Support for LDAP integration for authentication
	Auto commissioning
	Parental control, Service management
	DPI applications
	Speed Test App integration
	Mobile application plug-in for Home use cases

Customization	Turn-Key solution for Enterprise, Home, Public Wi-Fi
	SaMOG/TWAG, AAA, Security Gateway, Staging Server, OSS, Captive portal etc. can be configured with respect to underlying network topology
	SIM, non-SIM, 'open Authentication' based UE connectivity
	Support for all ISP topologies
	Fully automated PPPoE, IPv6, IPv4
	LBO, Management/Data plane can be customized based on requirement
	Orchestration with platforms like Robin.io
	LTE/5G co-existence
	Alarm customization
	Syslog export support for Security monitoring
	Automatic Periodic Backup of WLC data
	On-demand Backup mechanism
Support for restore WLC data from any of the backed-up data	

| Sizing Guidelines

The HCL SMARTWiFi Platform supports access point hardware with following specifications:

- Indoor AP (Wi-Fi 6): 4x4 MIMO (2.4 GHz) and 4x4 MIMO (5 GHz) concurrent
- Indoor AP (Wi-Fi 6): 2x2 MIMO (2.4 GHz) and 2x2 MIMO (5 GHz) concurrent

Scaling

vCPUs WLC	vCPUs analytics	RAM WLC	RAM analytics	Storage WLC	Storage analytics	APs	Concurrent users
80	264	80 GB	1088 GB	250 GB	166 TB	10,000	500 K
800	264	800 GB	1088 GB	2500 GB	166 TB	100,000	5 M

Staging Server Infrastructure requirements

	No. of nodes	vCPUs	RAM	Disk space
Master Node	3	2	8 GB	50 GB
Minion Node	2	4	8 GB	50 GB
DB nodes	3	4	8 GB	50 GB
NFS Server	2	2	8 GB	100 GB
Load Balancer	3	2	8 GB	50 GB

| Analytics Infrastructure Requirements

	Per node resource requirement				Total resource requirement		
Storage	Memory	vCPU	Role	Number Required	Storage (TB)	Mem (GB)	vCPU
1TB	96	24	Edge	1	1	96	24
1TB	96	12	Hadoop master	2	2	192	24
5TB	48	18	Hadoop data node + Kafka	10	50	480	180
1TB	96	12	Opentsdb	2	2	192	24
1TB	128	12	Redis	1	1	128	12
Total					56 TB	1088 GB	264 vCPU

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