E d g e **-** c o r **E**
NETWORKS

EDGECORE INTEGRATED WI-FI SOLUTION

TRANSFORMING THE WAY THE WORLD
CONNECTS

CONTENTS

E d g e - c o r E
NETWORKS

Company Profile

Edgecore Networks Corporation is a wholly-owned subsidiary of Accton Technology Corporation, the leading network ODM. Edgecore Networks delivers wired and wireless networking products and solutions through channel partners and system integrators worldwide for data center, service provider, enterprise, and SMB customers. Edgecore Networks is a leader in open networking, providing a full line of 1GbE, 10GbE, 25GbE, 40GbE, 50GbE, and 100GbE open and OCP switches that offer a choice of NOS and SDN software for data center, telecommunications, and enterprise network use cases.

Headquartered in the Hsinchu Science Park in northern Taiwan, Edgecore Networks was established in 2004 and formally spun-off in 2010 into an independent subsidiary responsible for the global branded business of the Accton Technology Group (www.accton.com) with a global presence in the US, UK, Poland, Russia, Turkey, Brazil, Singapore, Indonesia, and India.

"TRANSFORMING THE WAY THE WORLD CONNECTS" is the slogan of the company. Edgecore Networks offers scalable, converged networking solutions to best meet different customer needs for data center, service provider, enterprise, and small and medium business users.

Vision

The growth of cloud computing and the Internet of Things, along with the rise of open-source technologies and communities, is transforming how IT is developed, delivered, and used by businesses and consumers. Within an ecosystem of commercial partners and open-source communities, Edgecore Networks delivers networking solutions based on open hardware and software platforms that increase choice, freedom, greater control, encourage and quicken innovation, lower TCO, and stimulate new business models.
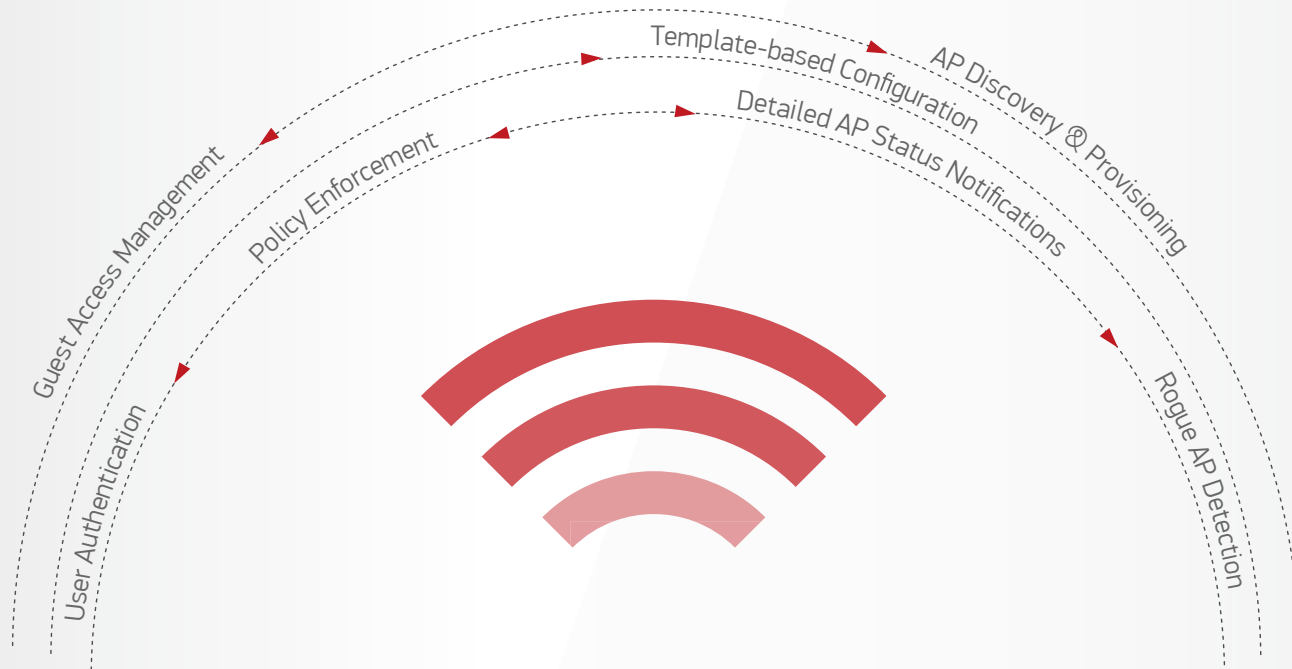
Mission

Edgecore Networks develops and delivers industry-leading open networking hardware and software products for data centers, telecommunications service providers, managed service providers, and enterprises. Edgecore Networks is a leader in the open network ecosystem, delivering complete solutions to customers with a broad set of partners and providing a cost-competitive advantage over traditional networking.

The underlying philosophy of Edgecore Networks is to provide professional wired and wireless solutions from the edge to the core. With a strong focus on complete solutions that generate value for customers and assist with realizing the potential of a digital-network society, Edgecore Networks offers a broad product portfolio spanning 100G/50G/40G/25G/10G/1G switching, enterprise-level wireless, and network management tools. We provide industry-leading products that address our customers' network requirements in different market segments from network infrastructure, data center switches, core switches, access switches, and indoor/outdoor wireless access points.

We shape the future of the Internet by creating unprecedented value and opportunity for our customers, employees, investors, and ecosystem partners. We transform how people communicate and collaborate on a connected planet.

TRANSFORMING THE WAY THE WORLD
CONNECTS

Guest Access Management

Policy Enforcement

Template-based Configuration

AP Discovery & Provisioning

Detailed AP Status Notifications

User Authentication

Rogue AP Detection

Managed Access & Guest Wi-Fi
Enhancing The Value Of Your Wi-Fi Network
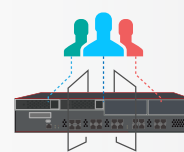
LOGIN

Wi-Fi Management
& Optimization

User Access &
Bandwidth Control

Guest Wi-Fi with
Social Media Login

Tiered Usage Quotas
with User Roles

Flexible Deployment
Architectures

EDGECORE SOLUTION APPLICATION SCENARIOS

External databases — LDAP NT Domain POP3 RADIUS SIP

Social media

Internal databases — Local On-demand Guest

E-mail / SMS

Username
user1
Password
****
Login
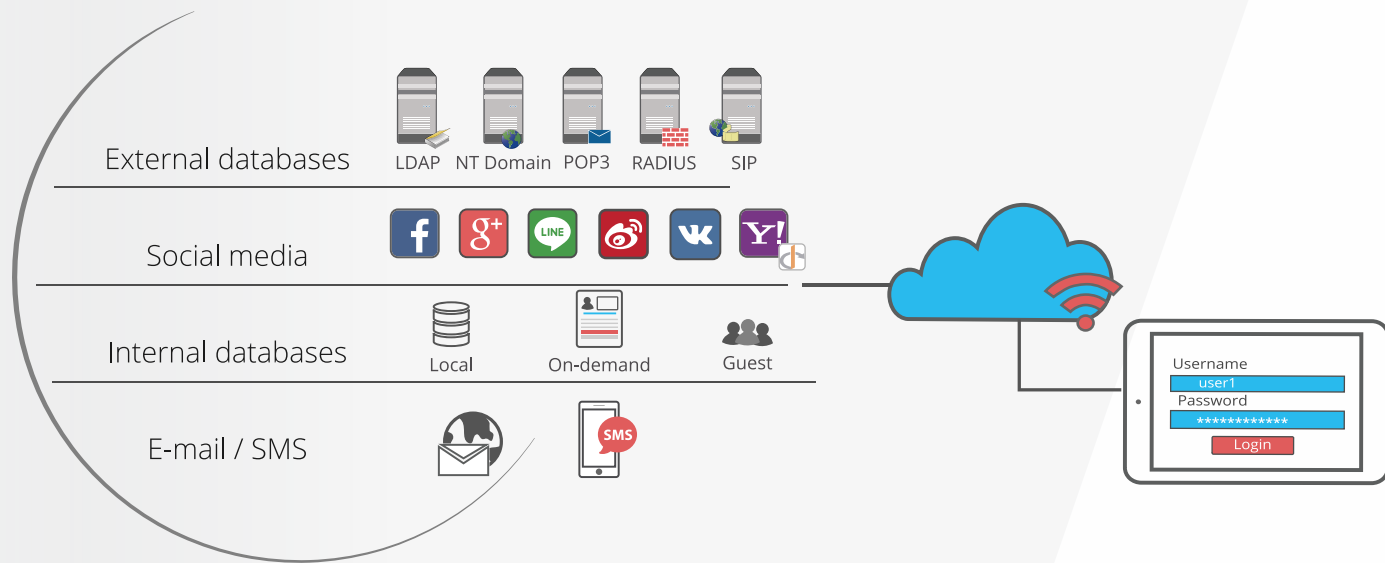
1 Enterprise user authentication for wired & wireless networks (Radius, LDAP , POP3, etc.)

2 Guest authentication for public hotspots (social media, e-mail, SMS, ticket printing, etc.)

3 Multiple customized captive portals for location-based advertising and data collection

4 Hotel Wi-Fi authentication with built-in Opera PMS integration

5 User access quota limitation by volume, duration, or time with multiple plans

6 Role-based user QoS & bandwidth policies for campuses and enterprises

7 Centralized AP management solution for Edgecore enterprise-grade Wi-Fi APs

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HOSPITALITY

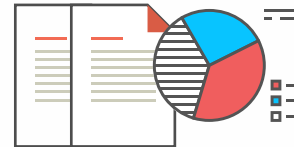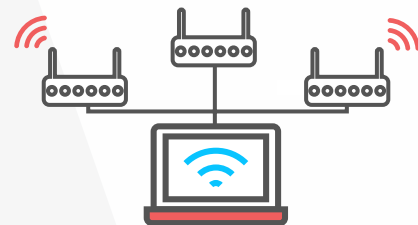Retain Hotel Guests with Easy to Use & Managed Wi-Fi

In recent years, reliable Wi-Fi has become one of the most important amenities for hotel guests. In addition to investing in the latest Wi-Fi technology, hotels are also seeking value-added applications to increase ROI, such as incorporating Wi-Fi within their loyalty programs or using Wi-Fi to collect guest information. Edgecore's Wi-Fi solution disrupts traditional hotel WLAN deployments by combining AP management, tiered Wi-Fi service, user policy enforcement, and PMS integration all in one solution. Compared to the separated gateway and controller architecture, Edgecore's design greatly reduces deployment costs and simplifies network management. Additional guest Wi-Fi features such as social media login, ticket printer integration, and on-demand accounts provides hotels with numerous ways to offer Wi-Fi to their guests.

FEATURES & BENEFITS

REAL-TIME USER ACTIVITY MONITORING AND REPORTING

With Internet usage becoming ever more convenient and widespread, hotels need sufficient tools at their disposal to track and trace user activity in the event of inappropriate usage. Edgecore Integrated Wi-Fi products provides detailed user statistics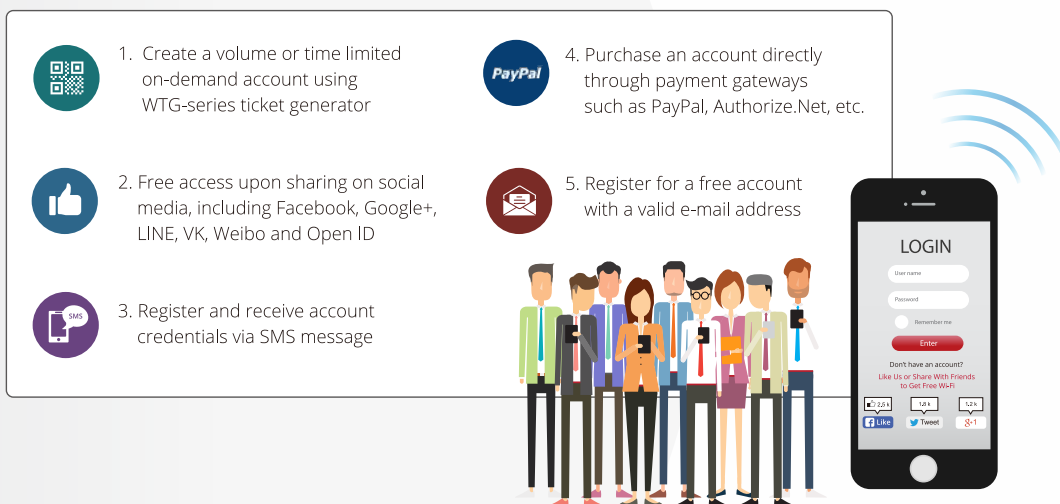, browsing history, and event logs that comply with these requirements while enhancing the IT staff's troubleshooting and maintenance capabilities. Besides, by analyzing user behavior such as number of devices per guest or average bandwidth consumed, hotels are able to better understand the preferences and needs of their guests and provide an improved guest experience.
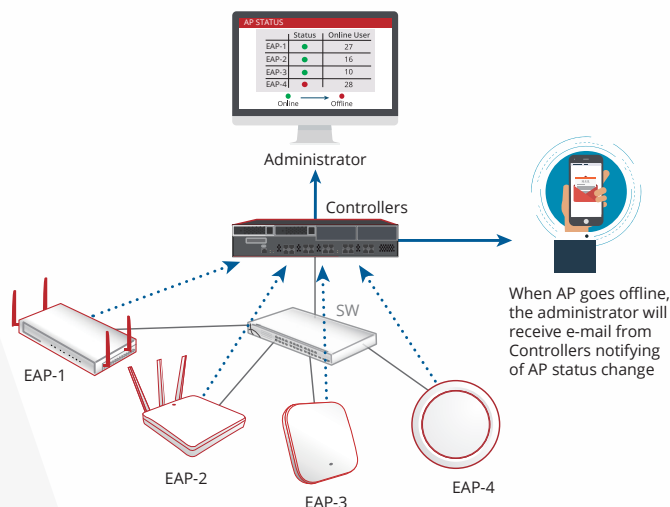
FLEXIBLE GUEST WI-FI ENABLEMENT

1. Create a volume or time limited on-demand account using WTG-series ticket generator

2. Free access upon sharing on social media, including Facebook, Google+, LINE, VK, Weibo and Open ID

3. Register and receive account credentials via SMS message

4. Purchase an account directly through payment gateways such as PayPal, Authorize.Net, etc.

5. Register for a free account with a valid e-mail address

Edgecore's solution also provides many alternative ways for hospitality venues to provide Wi-Fi access to their guests, from self-registration methods such as social media login to on-demand account creation with the Edgecore WTG ticket printer. The ability to collect more detailed customer information and generate direct bookings is increasingly become one of the key added values as owners seek to increase the ROI on wireless infrastructure.

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SEAMLESS INTEGRATION WITH ORACLE OPERA PMS

Typically found only in network access gateways, Edgecore has taken the Opera PMS interface and integrated it directly on the Edgecore-series gateway-controllers, becoming one of the only WLAN solutions on the market to offer the PMS interface directly in the same box together with AP management, user authentication, and user policy enforcement. This design allows hotels to significantly reduce initial infrastructure investment without sacrificing on any of the functionality.

Edgecore wireless Lan controller   **INTEGRATED**   PMS

ORACLE OPERA PMS

Hotels can easily create Wi-Fi accounts for guests without the need to operate two systems during guest check-in
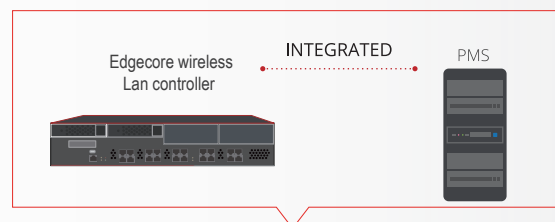
ON-DEMAND API
For those who use different PMS, they can use this API to create Wi-Fi accounts.

GUEST NAME   ROOM NO.
Ramon   612

DESCRIPTION   PRICE
Room   240.00

Internet   6.00

TOTAL $ 246.00

Automatic adjustment of account credentials during room change

612
Ramon
LOGIN

Easy guest login with room number and last name

KEEP GUESTS HAPPY AND RETURNING

ROOM 612
GREAT HOTEL
★ ★ ★ ★ ★

WELCOME

Individual accounts and bills for room sharing guests

Automatic adjustment of account credentials during room change

Guests can access Wi-Fi anywhere in the hotel using

TIERED WI-FI FOR HOTEL LOYALTY PROGRAMS

Regular Guest

One device at a time

256 kbps

Basic services e.g. email, web surfing

Royal Member

Up to three devices at the same time

No bandwidth limitations

Unlimited services e.g. VoIP, live streaming
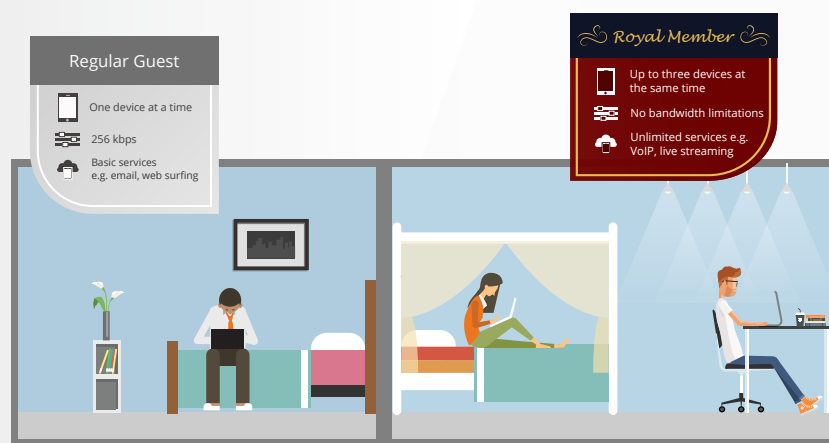
As hotels constantly seek ways to improve their loyalty programs, they have begun to incorporate Wi-Fi, one of the most important factors of guest satisfaction, into the key list of benefits. With Edgecore's billing plans and role-based policy enforcement functionality, hotels can easily create tiered Wi-Fi packages with differentiated services. Regular guests can be given free Wi-Fi with limited bandwidth, while loyalty members enjoy premium Wi-Fi with unlimited bandwidth.

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OPTIMAL PERFORMANCE IN CROWDED HOTEL LOBBIES

As users come in the venue, the AP closer to the entrance will naturally be preferred by devices due to the stronger signal strength. As a result, all the devices are trying to transmit on the same frequency, causing slow Wi-Fi connectivity.

Overload

Automatically steer devices to the most suitable access point in range depending on connected capacity, balancing the load across multiple APs.

Hotel IT administrators can easily mitigate network congestion in crowded areas such as hotel lobbies by utilizing Edgecore's wireless performance enhancing features, such as dynamic AP load balancing. This feature automatically adjusts each AP's transmit power according to the current connected devices status, steering new devices to other nearby APs that currently have fewer connections. As users come and go, the system will continually reassess and adjust the configuration to optimize overall network performance.

EDUCATION

Facilitate BYOD & Enrich Smart Learning with Secure, Scalable Wi-Fi

With educational apps and videos making their way into classrooms, technology is now drastically changing the way students learn. Laptops and tablets are instrumental in facilitating student teacher interaction, and ensuring that students receive the most effective learning. With Edgecore Wi-Fi, institutions can easily adapt to this new IT environment. Network administrators can perform detailed management of teacher and student access by creating multiple user roles, each with its own pre-defined set of policies and schedules. Furthermore, configurable wireless connectivity thresholds and AP load balancing help to mitigate the congestion caused by heavy concurrent access in areas such as lecture halls, providing students with an uninterrupted learning experience.

FEATURES & BENEFITS
COMPREHENSIVE EVENT TRACKING

With increasing security regulations in education Wi-Fi deployments, WLAN education solutions need to be able to effectively track all network activity. Edgecore gateway-controllers support numerous network logs and reporting mechanisms, such as the HTTP Web Log that records visited website histories of all users. Combined with the NAT Conversion Log, schools can easily trace internal to external network addresses when illegal or suspicious activities are performed. Finally, real-time e-mail notifications ensure that network downtime is minimized.
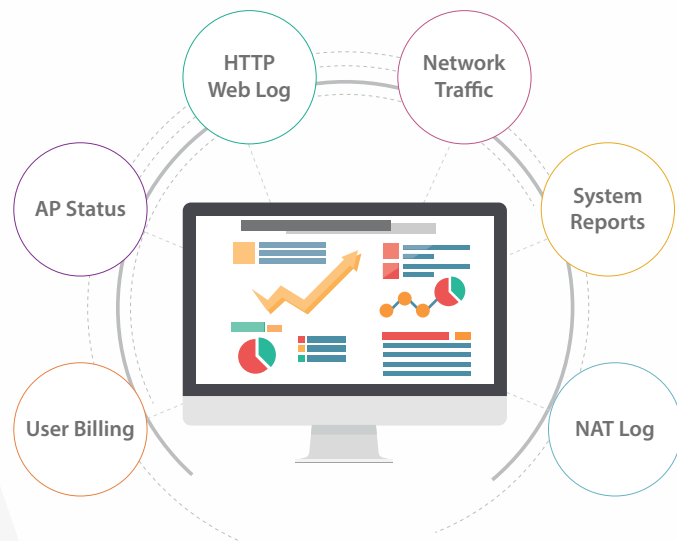
SCHEDULE & ROLE-BASED USER ACCESS CONTROL
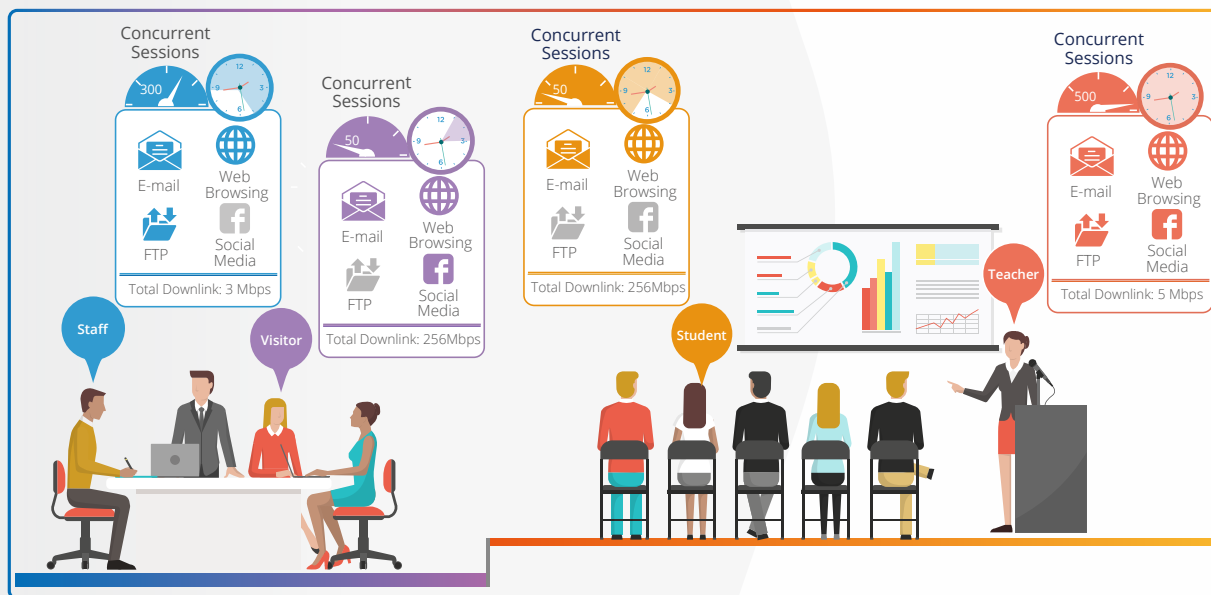
Powerful Wi-Fi access control is necessary for schools to protect critical network resources, have complete visibility over all users and devices, and quickly respond to any potential network issues. Edgecore's role-based user policies provide school IT administrators with the tools to differentiate network access privileges between faculty members, students, and guests. Furthermore, each role can be assigned with unique access policies depending on schedule, and granted access to the network depending on the location of the Wi-Fi AP they are associated to.

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OPTIMIZING WI-FI PERFORMANCE FOR HIGH DENSITY

Band Steering
5 GHz   2.4 GHz

Airtime Fairness
Legacy Clients   Equal Airtime   Modern Clients

Optimal Client Filtering
High RSSI   Low RSSI

As Density / Usage Increases...

Performance Deteriorates...
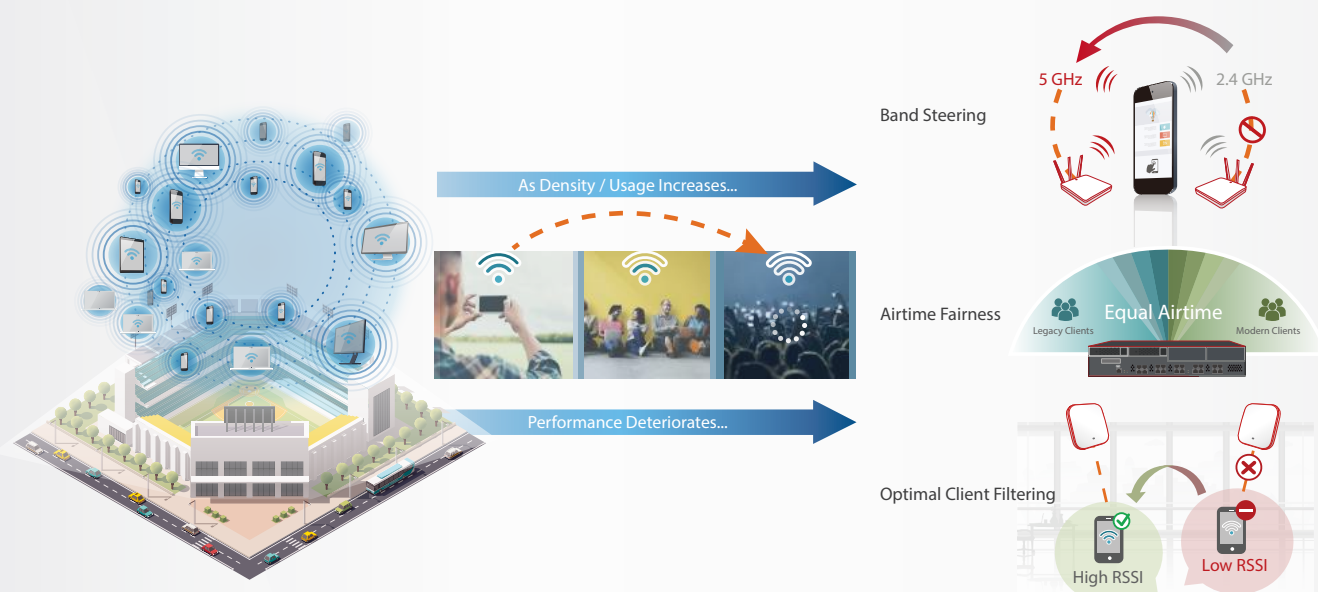
Classrooms and lecture halls today are typically the locations in a school or university with the highest density of Wi-Fi devices. In order to facilitate an effective e-learning experience, Edgecore's access points and Integrated Wi-Fi products support robust performance during periods of higher concurrent association, DHCP requests, and authentication traffic. Furthermore, IT administrators can configure detailed connectivity thresholds on the access points to intelligently manage available wireless spectrum resources to guarantee smooth network performance.

TRAFFIC PRIORITIZATION FOR RELIABLE E-LEARNING

Teacher & Student

1 Voice
2 Video
3 Best Effort
4 Background

Teacher
❶ Voice
❶ Video
❶ Best Effort
❶ Background

❶ Voice
❷ Video
❸ Best Effort
❹ Background
Student
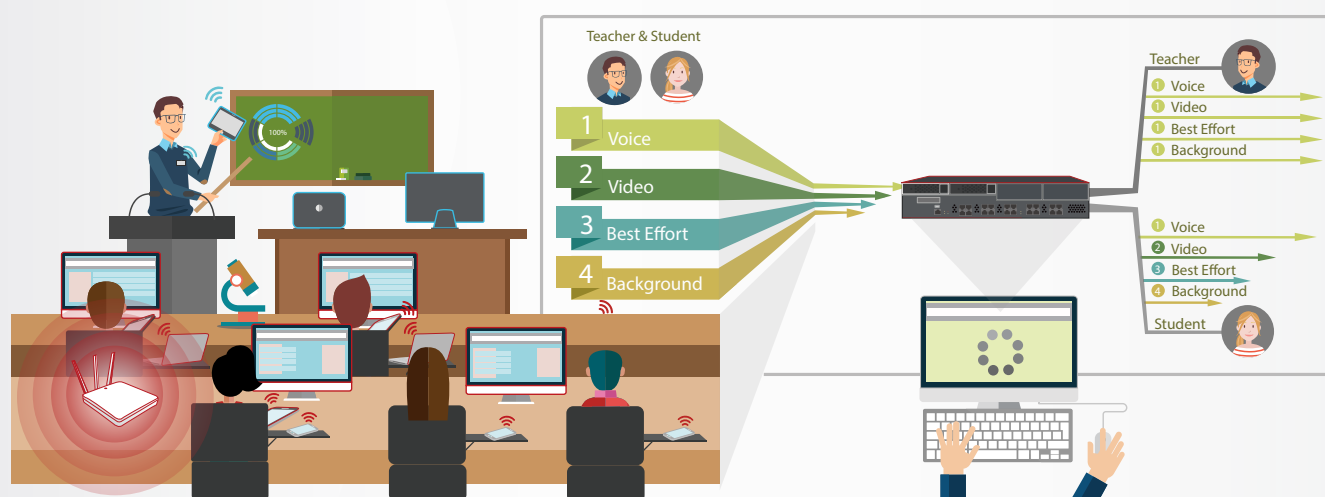
To ensure that teaching applications across Wi-Fi are not interrupted by regular student access, network administrators can use Edgecore's role-based traffic classification and QoS features to assign different priorities for each user role. For example, teachers can be given a higher priority over students, ensuring the smooth wireless transmission of teaching materials. This helps avoid potential network congestion or downtime, and ultimately increases the effectiveness of technology in the classroom.

IMPROVING HIGH-DENSITY WIRELESS PERFORMANCE

The threshold is set to a value that is **too insensitive** :
Transmits too often causing too many collisions

The threshold is set to a value that is **too sensitive** :
Incorrectly determine the availability of the wireless medium, resulting in poor network performance

With this function, the AP finds the right balance to transmit as often as possible without causing too many collisions.

Wi-Fi Performance

Channel Conflict

With CCA

Wi-Fi Performance

Increase overall network performance by finding the optimal configuration that allows the AP to transmit as often as possible without increasing potential over-the-air collision rate

In order to provide reliable Wi-Fi connectivity in high-density environments such as lecture halls or classrooms, it is often necessary to optimize the sensitivity of access points and more effectively filter out noise and interference sources. Edgecore APs come with the ability to automatically detect nearby wireless utilization and adjust the internal Clear Channel Assessment (CCA) threshold accordingly. As a result, the APs are able to transmit as often as possible without increasing wireless packet collision rate, leading to increased network capacity and an improved overall network performance.

ENTERPRISE

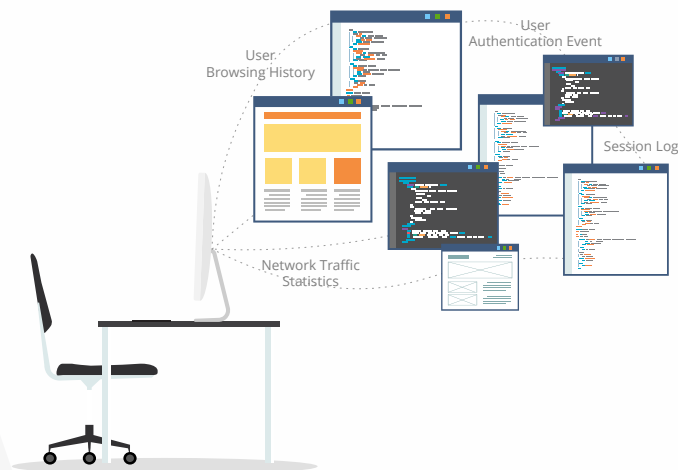Secure and Reliable Enterprise WLAN with Unified BYOD Policies

With BYOD assuming its role as an industry standard, enterprises are now facing new challenges on how to manage their wireless networks. Smartphones and tablets have become a potential source for security breaches, while bandwidth-hungry applications such as HD video conferencing increasingly threaten overall network stability and performance. Edgecore Wi-Fi solution for enterprises provides a secure and reliable wireless network by combining standards-based 802.1X with detailed access control by user and location. With just one set of equipment, network administrators are able to virtually segment the network between employees and visitors. Additionally, user firewall policies can be defined to limit network access, while rogue AP detection aids in the discovery of unauthorized Wi-Fi devices that may compromise the corporate network.
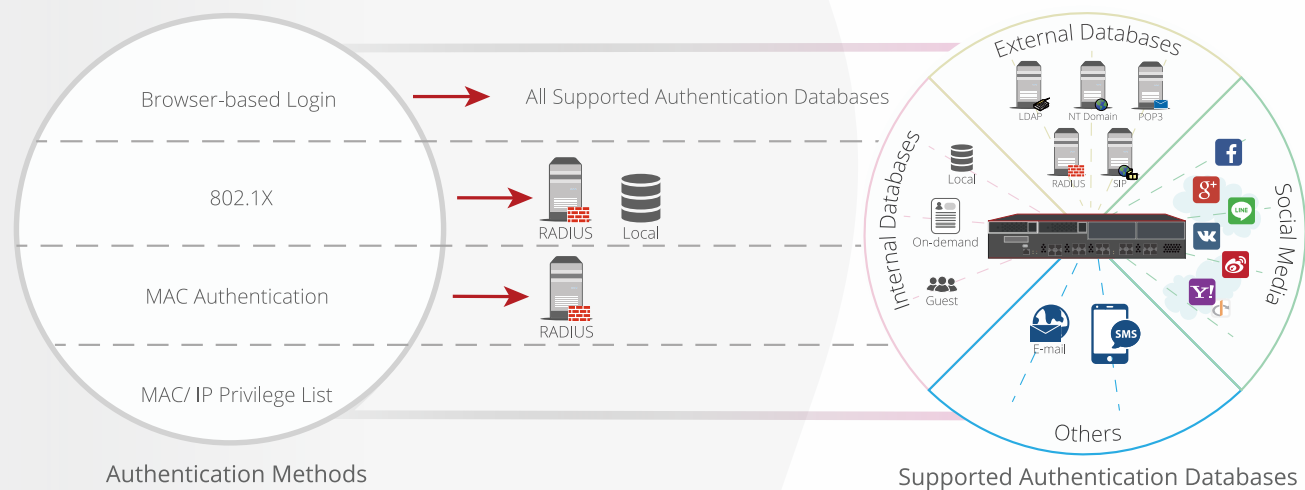
FEATURES & BENEFITS

DETAILED USER LOGS & REPORTS

With increasing security regulations in both public and enterprise Wi-Fi deployments, WLAN solutions need to be able to effectively track all network activity. Edgecore offers a complete set of logs & reports from its monitoring interface, including user browsing histories, NAT conversion logs, and all authentication related events. Furthermore, the guest Wi-Fi platform allows administrators to aggregate unique user information such as social media profiles, cellular numbers, or e-mail addresses for detailed analytics or troubleshooting.

User Browsing History

User Authentication Event

Session Log

Network Traffic Statistics

SECURE ENTERPRISE USER AUTHENTICATION

Browser-based Login — All Supported Authentication Databases

802.1X

RADIUS   Local

MAC Authentication

RADIUS

MAC/ IP Privilege List

Authentication Methods

External Databases

LDAP   NT Domain   POP3

Internal Databases

Local

RADIUS   SIP

On-demand

Guest

Social Media

Others

E-mail   SMS

Supported Authentication Databases

With the increase of BYOD devices such as smart phones and tablets accessing the company network, Wi-Fi access control is no longer optional. Enterprises need to have complete visibility of all users on their network as to prevent, identify, and fend off potential intruders. Therefore, Edgecore's WLAN solutions support both browser-based and 802.1X authentication mechanisms to ensure the proper identification of network users before accessing the network. Network administrators can easily configure customizable captive portals for web-based authentication of employees. Alternatively, network administrators can configure authentication using external databases that are already present in the enterprise network, such as LDAP, POP3, NT Domain, and RADIUS. Either way, only network users with the proper credentials can access the company network.

802.1X WITH LOCATION-BASED ACCESS CONTROL

With Edgecore's Service Zone functionality, enterprises can virtually segregate wireless network access depending on the physical location of access points. For example, certain areas of the office can be configured for restricted access to employees only, while public areas or lobbies can be open access to both employees and visitors. Furthermore, each Service Zone can have a unique configuration of enabled authentication databases, access schedules, user policies, and independent network administrators.

## DETECTING UNAUTHORIZED ACCESS POINTS

Sensor AP

Rogue AP

Rogue AP Displayed

Email Notification of Status Change
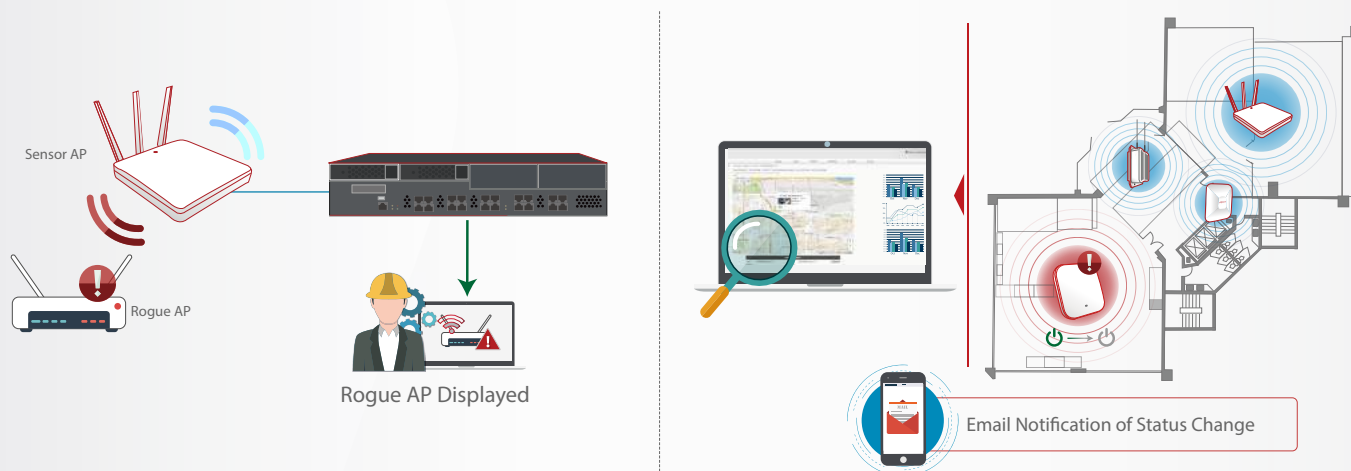
Rogue access points are often one of the primary sources of security beaches in an enterprise Wi-Fi network. They can potentially cause severe wireless interference, leading to network downtime and lost productivity. Edgecore's solution provides IT administrators with tools to easily monitor and detect rogue access points, allowing them to take swift responsive actions. Furthermore, network logs can show detailed information such as the access points that users authenticate from. Combined with detailed user events and browsing histories, Edgecore provides enterprises with full control over the security of their wireless networks.

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UNIFIED BRANCH OFFICE NETWORK POLICIES

Edgecore's solution supports both centralized and distributed access point deployments through flexible tunnel configuration between Edgecore APs and Integrated Wi-Fi products. For many enterprises, one of the key requirements is often to enforce unified policies across the entire corporation's headquarters and branch offices. By configuring the access points to completely tunnel traffic back to the Integrated Wi-Fi products in the headquarters, network administrators ensure the same set of user policies and network resource access regardless of geographical location. As the tunneling is configured on a per SSID level, organizations can also choose to allow only employee traffic to return back to the HQ, while guest and visitor traffic can locally break out to the Internet.
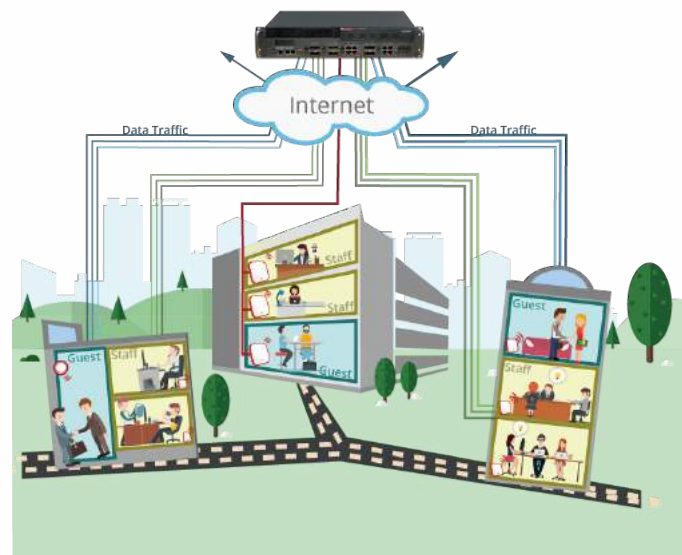
ROBUST DESIGN WITH HIGH AVAILABILITY
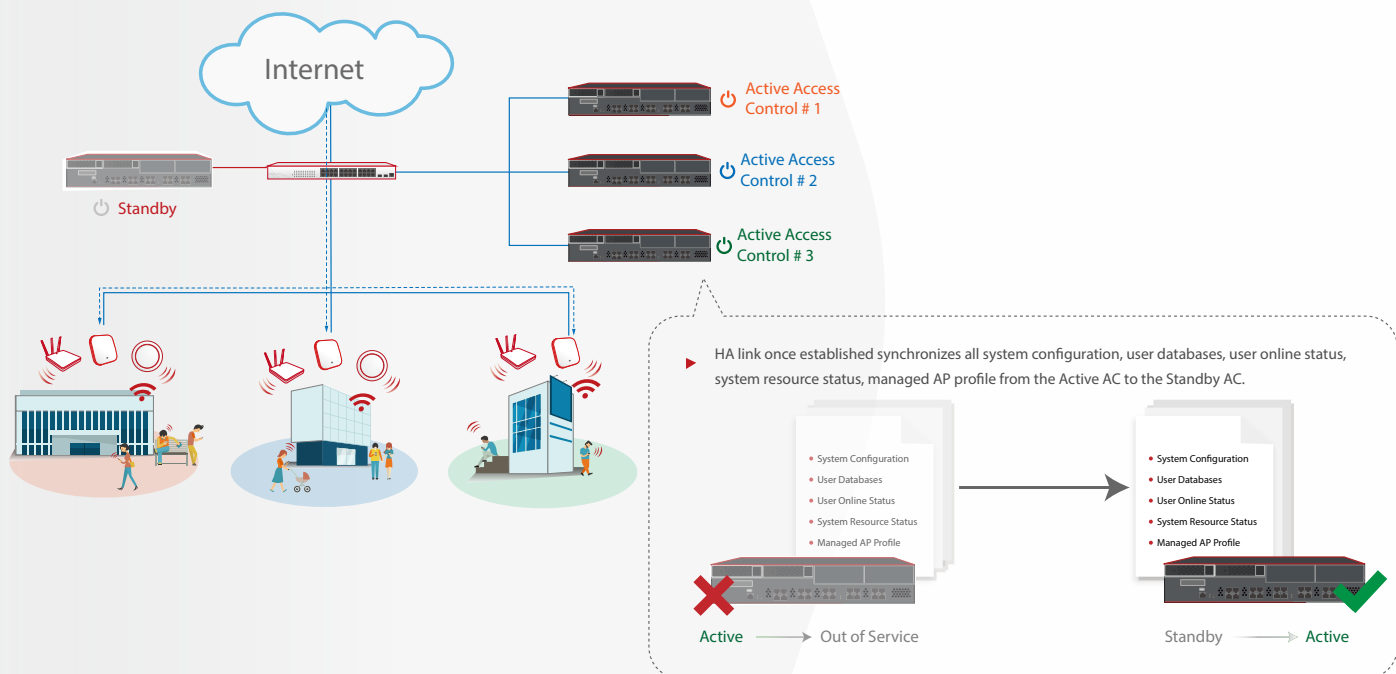
As Wi-Fi becomes the primary form of connectivity for many enterprises and organizations, a robust and reliable WLAN solution is of the utmost importance. To guarantee reliable WAN connectivity, Edgecore Integrated Wi-Fi products can be attached to two WAN links from separate ISPs for redundancy and load balancing purposes. Furthermore, the entire system can be deployed in High Availability, mitigating the potential lost productivity in the event of network downtime. And with the ability to configure backup AP management controllers for remotely managed APs, network administrators can guarantee seamless network operation and management.

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SMB

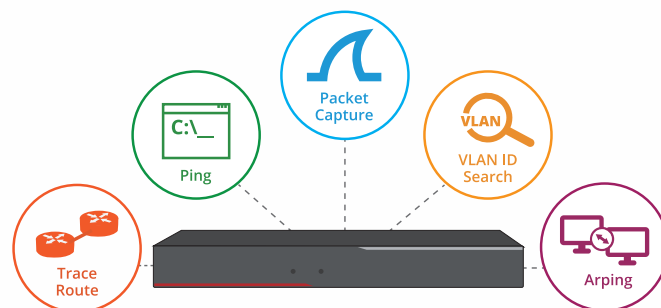Enhance Productivity with Secure, Reliable Wi-Fi

With today's rapid advances in technology and shifts in the paradigms of connectivity, businesses of all scales are faced with the unprecedented challenge of enabling productive and efficient mobility in their workplaces. SMBs desire the same level of enterprise security, but lack the IT resources of their large enterprise counterparts. Designed with simplicity in mind, Edgecore offers an affordable and easy to set up WLAN solution, manageable even by those who are not tech-savvy. In addition, enterprise-grade features such role-based user policy enforcement, detailed network monitoring, and real-time reporting are all built-in to the Edgecore solution. These fine-grained management functions also enable a Wi-Fi environment that is more secure and has a higher performance, allowing SMBs to enjoy the same level of wireless connectivity as large enterprises.

FEATURES & BENEFITS

WI-FI DEPLOYMENT MADE EASY

When it comes to wireless network infrastructure, the most critical issue for SMBs is the lack of resources to properly deploy and manage the network. Edgecore's SMB Wi-Fi solution eliminates many repetitive and cumbersome tasks during initial network deployments through automatic AP discovery and provisioning. The management system is ready out of the box, and can be easily accessed using any PC or mobile device. Finally, integrated troubleshooting utilities in the management GUI allow network engineers to quickly trace and identify connectivity issues.
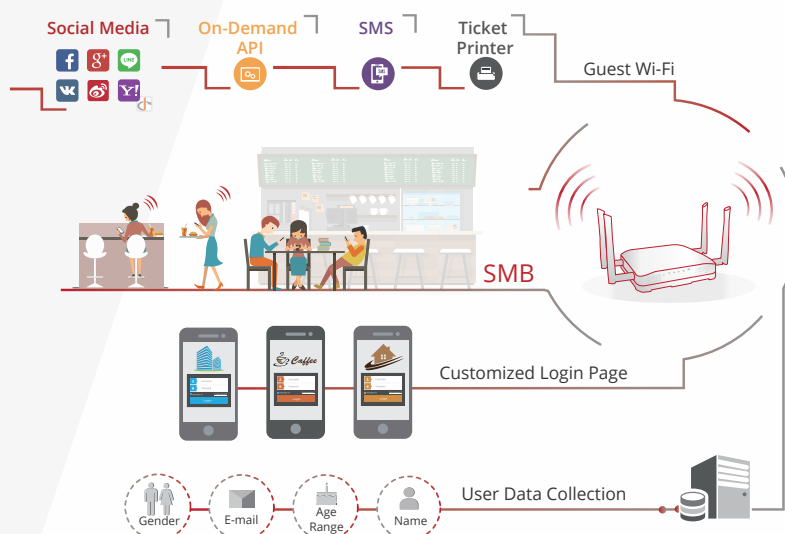
Ping

Packet Capture

VLAN ID Search

Trace Route

Arping

SIMPLE VISIBILITY OF THE ENTIRE NETWORK

Number Of Associated Devices

VAP Traffic Statistics

Transmitted and Received Packets/Bytes

Memory Usage

With an intuitive and easy-to-digest network dashboard, network administrators can more effectively monitor the current status of all access points, associated devices, and network traffic. Additionally, APs in distributed site deployments can be easily grouped together and viewed on a map, and automated e-mail notifications can be generated in the event of critical issues such as APs going offline. By minimizing management complexities, Edgecore helps SMBs deploy an enterprise-grade Wi-Fi network without the extra burden on IT resources.

ALL-IN-ONE WIRELESS HOTSPOT ROUTER

Compared to traditional Wi-Fi deployments consisting of access points and a central WLAN controller, the all-in-one wireless hotspot router is a Edgecore product designed specifically for SMBs such as coffee shops and restaurants. Although similar in functionality, it provides a unique advantage of having hotspot functionality such as guest Wi-Fi, user authentication, billing plans, and on-demand accounts all in the access point itself. No additional cabling is necessary, and small business owners can quickly get an enterprise-grade manageable Wi-Fi up and running.

Social Media

On-Demand API

SMS

Ticket Printer

Guest Wi-Fi

SMB

Customized Login Page

Gender

E-mail

Age Range

Name

User Data Collection

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CARRIER

Reduce Network Congestion with Wi-Fi Offloading

For the past few years, 3G/4G networks have become increasingly congested due to the rising penetration of smartphones and tablets. Telecom operators are determined to provide a better communication environment for their customers. As the cost of expanding existing cellular coverage is prohibitive, many operators choose to deploy Wi-Fi, which offers higher throughput and lower RAN costs per gigabit. Edgecore's carrier-grade Wi-Fi access layer offloading solution includes Wi-Fi access points, WLAN gateway-controller with scalable AP management, and a high performance policy enforcement gateway functionality supporting EAP-SIM authentication. Additional features such as high availability, lawful interception, and specific user routing have also been designed to meet the unique specifications of each operator's requirements.

FEATURES & BENEFITS

CARRIER-GRADE EAP-SIM & UAM AUTHENTICATION

One of the top priorities for carriers today is to monetize their Wi-Fi hotspot deployments while providing smooth and seamless offloading between cellular and Wi-Fi networks. Edgecore's solution for carrier Wi-Fi has been proven in large-scale nationwide deployments, supporting login methods such as 802.1X with EAP-SIM, UAM (browser-based login), and WISPr. Additionally, features in Edgecore Integrated Wi-Fi products such as IP address assignment, lawful interception, and specific routing have been designed and optimized to support carrier-grade performance.
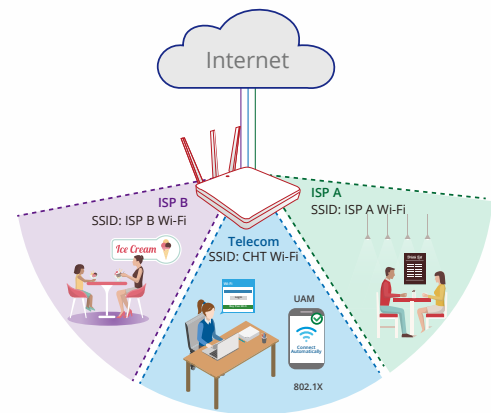
LOCATION-BASED ADVERTISING WITH SCALABLE VLANS

Although Wi-Fi networks have yet to demonstrate a competitive average revenue per user compared to traditional cellular technologies, operators have discovered unique methods for Wi-Fi monetization. With Edgecore, operators can engage in new business models for revenue generation. For example, Edgecore's solution supports scalable Q-in-Q VLANs, allowing operators to assign a unique VLAN location ID to each hotspot access point. Combined with customizable captive portals and Edgecore's Service Zone concept, operators can enable a location-based advertising platform for business customers nearby the deployed Wi-Fi hotspots.
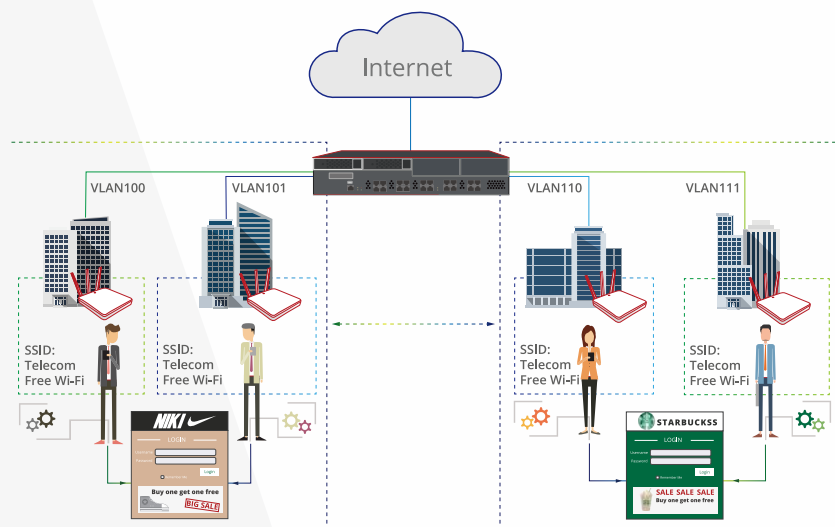
PUBLIC OUTDOOR WI-FI ACCESS CONNECTIVTY

For many operators and service providers, offering outdoor Wi-Fi connectivity in public locations such as parks is now a necessity. Edgecore's outdoor Wi-Fi access solution combines reliable wireless connectivity with the powerful user authentication, access control, and guest Wi-Fi functionality offered by Edgecore's access control gateways. QoS features ensure that mission-critical services such as VoIP and video-streaming are prioritized, while configurable advanced AP parameters and thresholds help to optimize Wi-Fi performance. Furthermore, network administrators can easily manage the entire wireless deployment from the central controller, monitoring user activity, collecting valuable customer information, and generating revenue from login page advertisements.

Edge-corE
NETWORKS

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