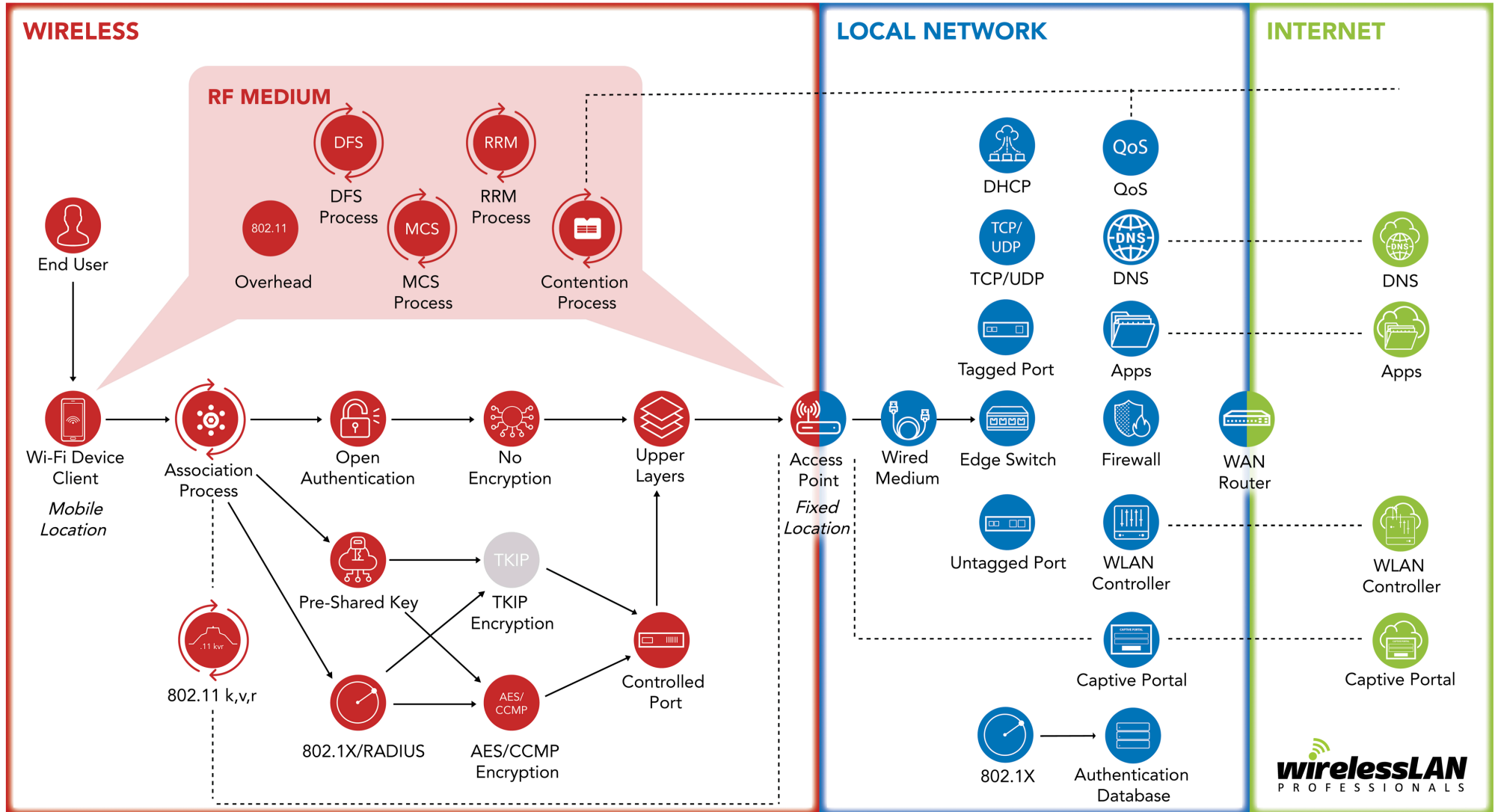


WIRELESS LAN TROUBLE SHOOTING - POTENTIAL CAUSES



Potential Wireless LAN Troubleshooting Causes

	Wired/Wireless	Location	Potential Issues
1	Wireless	End User	Skills, Knowledge Perceptions, Device on/off, Understanding of Concepts & Device capabilities, Wi-Fi vs Cellular
2	<i>Mobile</i>	Wi-Fi Client Device	Drivers, Radio Capabilities, Profiles, Supported PHY, QoS, Power Save, Applications, Location, Vendor IE Support, Chipset Behavior, Roaming Algorithms, Auto-Negotiated MCS, MDM, Protection
3		RF Media	RSSI, SNR, SNIR, Primary & Secondary Coverage, CCI/ACI, Retry Rates, Average MCS, Jitter, Latency, Consistency, Regulatory Domains, Non-Wi-Fi Interference, Spectrum Analysis
4	Per Frame Tx	Contention Process	Preamble Detect, Energy Detect, Triggers, NAV Timers, TxOP, AIFS, Random Slots, QoS, WMM, Duration ID, Ch Capacity, Non-Wi-Fi Inteferece
5	Per Frame Tx	MCS Process	Per Frame Decisions - Modulation Technique, Coding Technique, Ch Width, Guard Interval, Spatial Streams, Tx Power, ACK vs No ACK, TX decides
6	Per Time	Radio Resource Mgmt	Per Period Decisions - Channel, Tx Power, CCI, ACI, Noise, Duty Cycle, Retry Rates, CRC's, Load, Ch Width, DFS, User Traffic, Reg Domain, KPI's, Thresholds, Neighbor Discovery, Interference, Timing
7	Per Time	DFS Process	802.11 is NOT primary User - AP Scans for 60-Seconds, AP Enabled, Continuous Scanning, If RADAR detected, send CSA, Change to new CH, After 30-min can return, after 60-second scan
8	Per Frame Tx	Single Frame on RF	Overhead to delivery IP Payload - AIFS, CW, BPSK Preamble, RTS, SIFS, Preamble BPSK, CTS, SIFS, Preamble, Preamble VHT, Header MBR, Payload PHY rate, CRC, SIFS, Preamble, ACK
9	Per Timers	Association Process	Beacon, Probe Request, Probe Reponse, Authentication Request, Authentication Response, Association Request, Association Response, Decide on which AP by: RSSI, SNR, Auth Method, Encrypt Method, Channel Switch Announcement, Error Ratios, MCS/Data Rates Supported, Heuristics, Internal Lists, De-Authentication, Dis-Associate, 802.11 k, v, r, MBR, Proprietary Methods!
10		802.11 k, v, r	AP's try to influence the roaming decisions via 'standard' modes
11	Per Changes	Authentication Process	Open, Pre-Shared Key, 802.1X RADIUS, PSK includes Exchange of 4-Way Handshake to trigger Encryption Keys, 802.1X EAP Exchange, ending in 4-Way Handshake
12		Encrytion Process	None, TKIP, AES/CCMP, Punishment for using TKIP, Confusion with Wi-Fi Alliance naming - WPA2 PSK... is PSK-WPA2
13	From LAN	Upper Layers	DHCP, IP, DNS, VLAN, Subnet Mask, Default Gateway, Captive Portal
14		Controlled Port	AP Controls which 802.11 Frames can cross Wireless to Wired Boundary
15	<i>Fixed</i>	Access	Configurations, SSIDs, Minimum Basic Rates, Supported PHY Rates, Band Steering, Client Control, Radio Capabilities, Tx Rates, Client Isolation, Roaming, QOS
16	Local Network	Point	PoE, Antenna Pattern, Mounting, 1GB backhaul limit, AP Locations, Physcial Layer Issues, Firmware Revisions, Custom Configurations, RRM/ARM, Proprietary
17		Wired Medium	EIA/TIA 568A/B, Category Mismatch, Validation Tests, Grounding, other issues
18		Edge Switch	VLANs, Port Speeds, PoE, Configurations, QoS, End-to-End?, COS vs DSCP
19		Local Network	Distributed vs Centralized Forwarding, ACLs, VLANs, QoS, Tunnels, Layers, NAT
20		TCP/UDP	Following all TCP issues as well as UDP reasons for using each
21		Quality of Service	Tagged Port vs Untagged Port, DSCP, WMM Categories, End-to-End QoS
22		Applicatons	MTU, TCP Window, Round Trip Time, Processing Time, TCP Retransmission times
23		DHCP Server	Lease Durations, Configurations, Broadcast Storms, Latency, Performance, Address Pool Scopes, Scalability, DHCP Options, Auto Renew
24		DNS	Configuration, Scalability, Security, Accuracy, Customization, Control, Blacklists
25		802.1X/RADIUS	Configuration, Ports, Ranges, Licensing Issues, EAP types, Custom VSA, Scalability, Resouces, Certificate Issues, Fast/Secure Roaming types
26		Active Directory	Accounts, Credentials, EAP Compatibility, Custom RADIUS Attributes
27		Controller Functions	Code Versions, Bugs, Configurations, Local vs Cloud, Licensing Issues, Distributed vs Centralized Forwarding, VLAN choices
28		Firewall	Firewall Rules, Capacity, Compatibility, Rate Limiting, Bandwidth Shaping
29		WAN Router	Size of Internet Pipe, Inernet Destination Issues, Costs, Availability, Consistency
30	Internet	Internet Connection	Bandwidth Throttling, Jitter, Latency
		Captive Portal	Security, Client Issues, Privacy, Friction, Triggers, Certificates, DNS, Captive Portal Location, Control, Monetization, Legal, MiFi