



FWA7 Root Plus & Root & Leaf Plus

MLO-Enabled PTMP Solution

FWA7 Root Plus, Root and Leaf Plus bring multi-gig connectivity to places fiber can't reach – delivering fast, reliable service that's simple to deploy and manage. With Root and Root Plus as the powerful outdoor WiFi 7 PtMP base stations and Leaf Plus as the high-performance subscriber CPE, WISPs can extend coverage farther and serve more deployment scenarios with less effort.

Powered by Zyxel's adaptive antenna technology (smart antenna) with dual-beam geometry, Root Plus optimizes both near- and far-field coverage for stronger link margins, more consistent performance, extended range and fewer costly truck rolls. Together with Root and Leaf Plus, the FWA7 portfolio gives WISPs the flexibility to choose the right base station for each service area while delivering reliable WiFi 7 PTMP connectivity.



WiFi 7 MLO

5GHz + 6GHz combined for higher speed and reliability



Dynamic Time-Based Resource Management

Adaptive scheduling reduces collisions and keeps latency low



Smart Antenna

Dual-beam design for stronger near- and far-field coverage



Smart Rate Limits

Fair sharing that controls bandwidth without adding latency



Nebula Cloud Management

Zero-touch setup, remote monitoring, and open APIs



Solving key WISP challenges

- Deliver multi-gig services without fiber builds
- Maintain service continuity under interference/partial link loss
- Simplify operations with cloud-based zero-touch provisioning and monitoring
- Maximize spectrum use in dense or high-traffic deployments
- Enforce fair bandwidth policies with Smart Rate Limits

FWA7 Root Plus

Premium 4x4 outdoor WiFi 7 PTMP base station for high-capacity coverage and performance-demanding service areas.

FWA7 Root

Flexible 2x2 outdoor WiFi 7 PTMP base station with support for compatible third-party external antennas, offering greater flexibility to meet different coverage and deployment needs.

FWA7 Leaf Plus

High-performance subscriber CPE that connects to the PTMP base station for reliable multi-gig last-mile access.

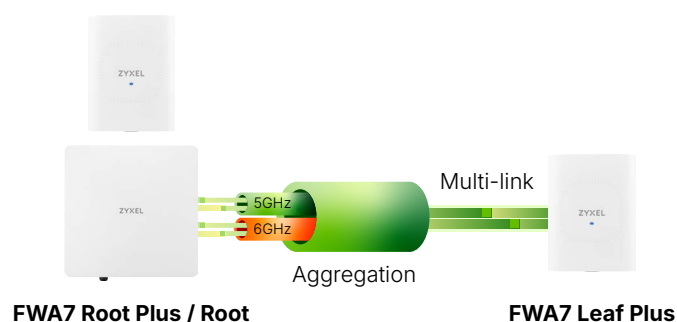


Benefits

WiFi 7 Multi-Link Operation (MLO)

5GHz & 6GHz aggregation

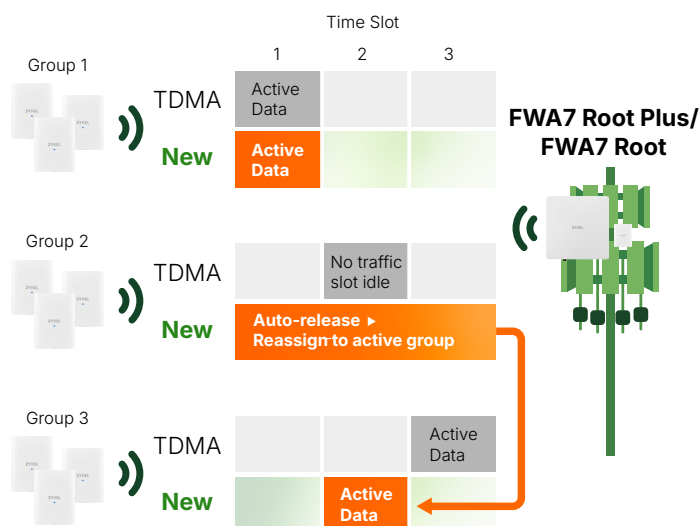
WiFi 7 MLO combines 5GHz & 6GHz channels for faster, more resilient links. Each subscriber gets up to 4.4 Gbps*, with sector capacity up to 7 Gbps*. With built-in failover, WISPs can deliver multi-gig service without fiber.



Dynamic Time-Based Resource Management

Lower latency, higher efficiency

This feature dynamically allocates airtime slots in real time to reduce collisions and maximize efficiency. It lowers latency and stabilizes throughput in dense or long-range PTMP deployments — delivering smoother user experiences and greater sector capacity.

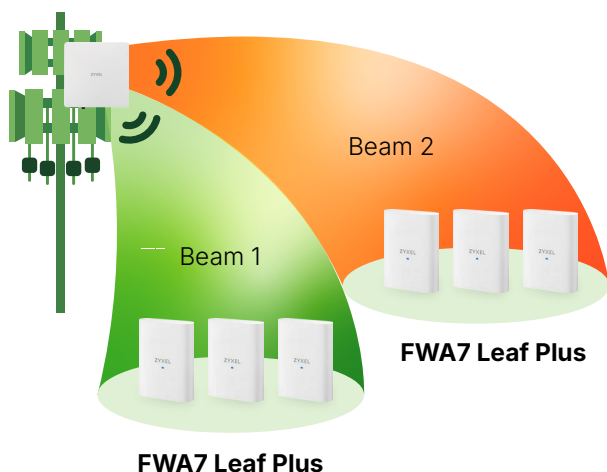


Smart Antenna

Near- and far-field coverage

This technology uses dual-beam geometry to optimize coverage for both near- and far-field clients. It delivers stronger link margins, more consistent coverage, extended range, and fewer costly truck rolls from alignment issues.

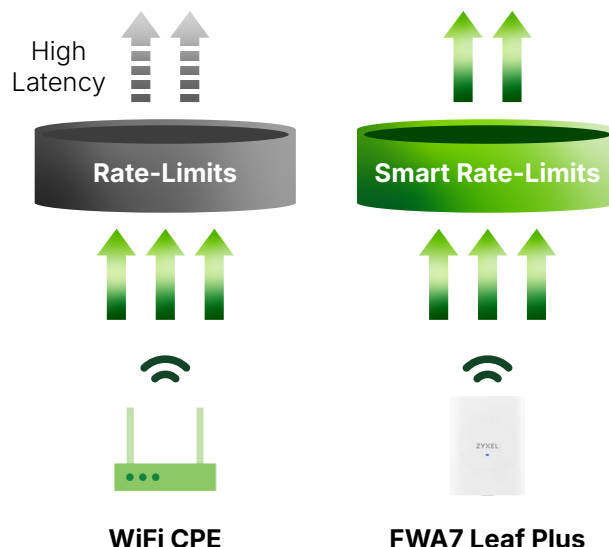
FWA7 Root Plus Smart Antenna



Smart Rate Limits

Dynamic per-packet flow QoS

Traditional rate limits cap bandwidth, causing slower speeds and higher latency once users exceed the limit. Smart Rate Limits keep latency stable even beyond the cap, ensuring fair use, smoother performance, and a better overall user experience.



Nebula Cloud Management

Zero-touch provisioning & APIs

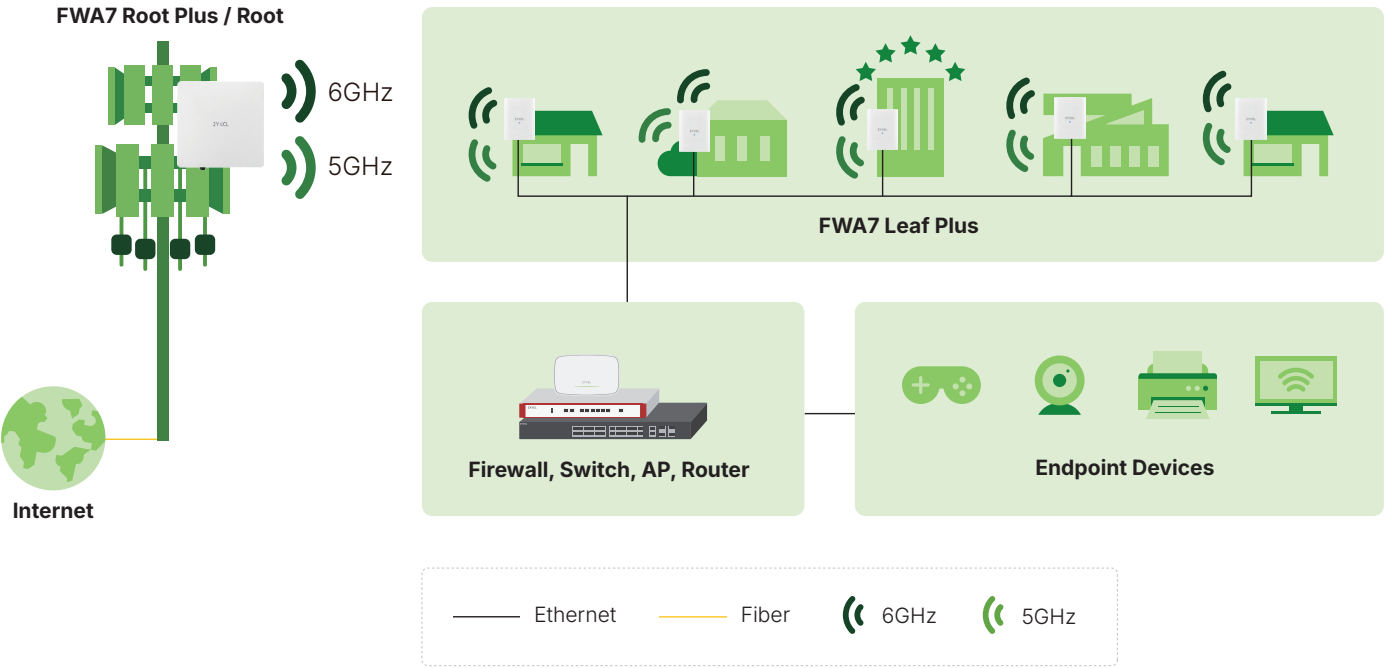
This platform provides a centralized portal for zero-touch provisioning, remote monitoring, firmware and policy updates, and API integration. It streamlines onboarding and enables automation at scale, helping WISPs reduce truck rolls, cut OPEX, and accelerate deployments.



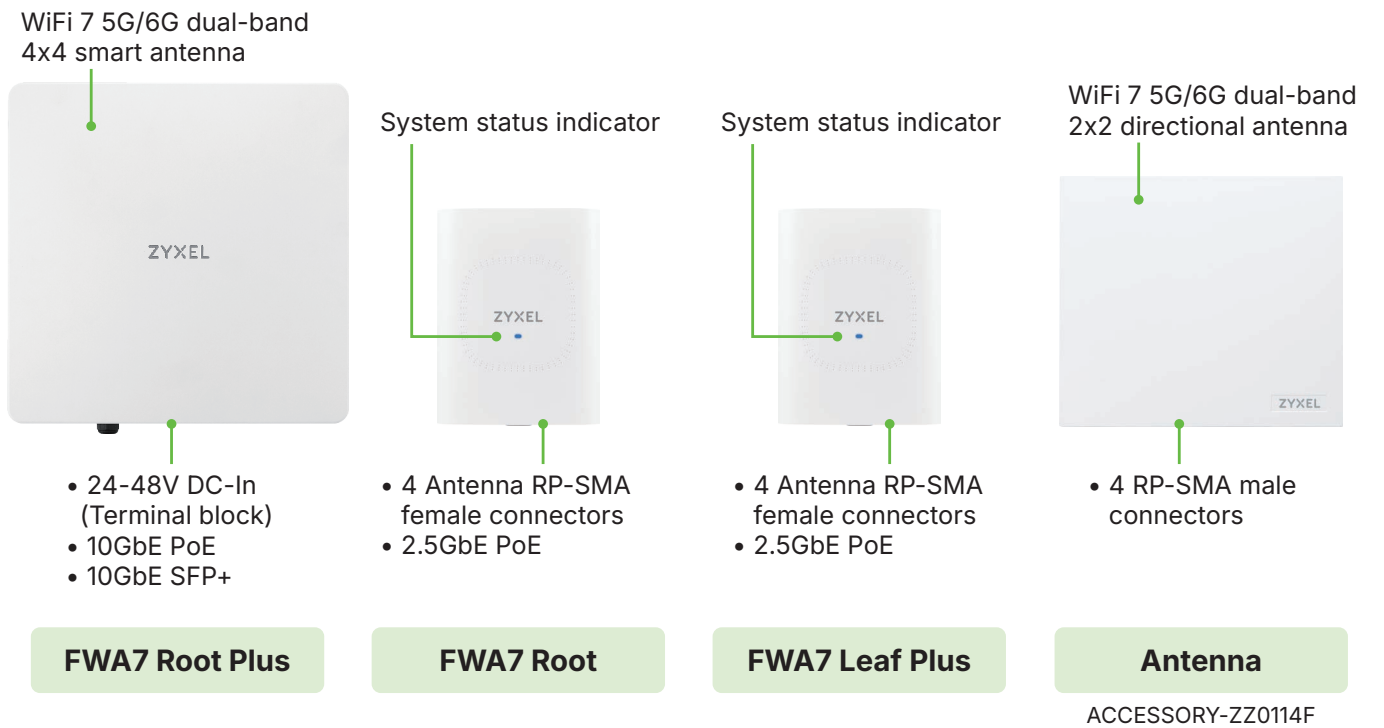
nebula



Application Diagram



Interface Description



Specifications

Model		FWA7 Root Plus	FWA7 Root	FWA7 Leaf Plus
Product name		802.11be (WiFi 7) 5G/6G 4×4 Dual-Radio PTMP Base Station	802.11be (WiFi 7) 5G/6G 2×2 Dual-Radio PTMP Base Station	802.11be (WiFi 7) 5G/6G 2×2 Dual-Radio PTMP Subscriber CPE
				
Wireless				
Standard		IEEE 802.11 be	IEEE 802.11 be	IEEE 802.11 be
MIMO		4×4 MU-MIMO	2×2 MU-MIMO	2×2 MU-MIMO
Wireless speed	5G	8646Mbps	4324Mbps	4324Mbps
	6G	11530Mbps	5764Mbps	5764Mbps
Frequency band	5G	USA(FCC): 5.15 to 5.36 GHz; 5.471 to 5.850 GHz	USA(FCC): 5.15 to 5.36 GHz; 5.471 to 5.850 GHz	USA(FCC): 5.15 to 5.36 GHz; 5.471 to 5.850 GHz
	6G	USA(FCC): 5.925 to 6.425 GHz; 6.525 to 7.125 GHz	USA(FCC): 5.925 to 6.425 GHz; 6.525 to 7.125 GHz	USA(FCC): 5.925 to 6.425 GHz; 6.525 to 7.125 GHz
Bandwidth	5G	20/40/80/160/240 MHz	20/40/80/160/240 MHz	20/40/80/160/240 MHz
	6G	20/40/80/160/240/320 MHz	20/40/80/160/240/320 MHz	20/40/80/160/240/320 MHz
Modulation		up to 4096 QAM	up to 4096 QAM	up to 4096 QAM
RF Design				
Antenna type		Sector Smart Antenna	External Antenna	External Antenna
Antenna gain	5G	15.2 dBi	N/A	N/A
	6G	14.6 dBi	N/A	N/A
HPBW (Azimuth)	5G	70°	N/A	N/A
	6G	70°	N/A	N/A
HPBW (Elevation)	5G	17°	N/A	N/A
	6G	18°	N/A	N/A
Minimum Receive sensitivity (dBm per chain)	MCS0	20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz: -80	20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz: -80	20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz: -80
	MCS7	Royal: 20MHz: -72, 40Mhz: -69, 80MHz: -66, 160MHz: -63, 320MHz: -60	20MHz: -72, 40Mhz: -69, 80MHz: -66, 160MHz: -63, 320MHz: -60	Royal: 20MHz: -72, 40Mhz: -69, 80MHz: -66, 160MHz: -63, 320MHz: -60
	MCS9	20MHz: -68, 40Mhz: -65, 80MHz: -62, 160MHz: -59, 320MHz: -56	20MHz: -68, 40Mhz: -65, 80MHz: -62, 160MHz: -59, 320MHz: -56	20MHz: -68, 40Mhz: -65, 80MHz: -62, 160MHz: -59, 320MHz: -56
	MCS11	20MHz: -62, 40Mhz: -59, 80MHz: -56, 160MHz: -53, 320MHz: -50	20MHz: -62, 40Mhz: -59, 80MHz: -56, 160MHz: -53, 320MHz: -50	20MHz: -62, 40Mhz: -59, 80MHz: -56, 160MHz: -53, 320MHz: -50
	MCS13	20MHz: -56, 40Mhz: -53, 80MHz: -50, 160MHz: -47, 320MHz: -44	20MHz: -56, 40Mhz: -53, 80MHz: -50, 160MHz: -47, 320MHz: -44	20MHz: -56, 40Mhz: -53, 80MHz: -50, 160MHz: -47, 320MHz: -44
Front to back ratio		>20dB	N/A	N/A
WLAN Feature				
WDS		Yes	Yes	Yes
MLO		Yes	Yes	Yes
AFC		Yes	Yes	Yes
Dynamic Time-based Resource Management		Yes	Yes	Yes

Model	FWA7 Root Plus	FWA7 Root	FWA7 Leaf Plus
Physical Interface			
Ethernet Port	1× 1/2.5/5/10 GbE RJ-45 1× 1/10 GbE SFP+	1× 1/2.5 GbE RJ-45	1× 1/2.5 GbE RJ-45
Power	PoE 802.3bt DC-In: 24-48V/2.5A Terminal Block	PoE 802.3at	PoE 802.3at
Surge protection	6KV	6KV	6KV
Antenna connector	N/A	4 ×50 ohm, RP (Reverse Polarity) SMA Female	4 ×50 ohm, RP (Reverse Polarity) SMA Female
GPS	L1/L5	L1/L5	L1/L5
Physical Specifications			
Dimension (WxDxH)(mm/in.)	410 × 410 × 110 / 16.14 × 16.14 × 4.33	180 × 137 × 50 / 7.09 × 5.39 × 1.97 incl. wall mount	180 × 137 × 50 / 7.09 × 5.39 × 1.97 incl. wall mount
Item Weight (g/lb)	5130 / 11.31	681 / 1.5	681 / 1.5
Environmental Specifications			
Temperature	Operation	-40°C to 70°C/-40°F to 158°F	-30°C to 60°C/-22°F to 140°F
	Storage	-50°C to 80°C/-58°F to 176°F	-40°C to 70°C/-40°F to 158°F
Humidity	Operation	10% to 95%	10% to 95%
	Storage	10% to 90%	10% to 90%
IP-rating	IP-68	IP-56	IP-56
Wind load	55 m/s	55 m/s	55 m/s
Software			
Operation mode	Bridge	Bridge	IP-Passthrough/NAT
Smart Rate-Limit	Yes	Yes	Yes
IP Host	IPv4/IPv6	IPv4/IPv6	IPv4/IPv6
DHCP	Client	Client	Server / Client
Management mode	Nebula Cloud Management	Nebula Cloud Management	Nebula Cloud Management

Model	Antennas (ACCESSORY-ZZ0114F)
Product name	High Gain Directional Antenna for Root/Leaf Plus



RF Design		
Support frequency	5G	5150-5850MHz
	6G	5925-7125MHz
Antenna gain	5G	14.6 dBi
	6G	14.6 dBi
HPBW (Azimuth)	5G	20°
	6G	25°
HPBW (Elevation)	5G	16°
	6G	17°
Front to back ratio		>15dB
Physical Interface		
Antenna connector	4xRP (Reverse Polarity) SMA Male	

Model		Antennas (ACCESSORY-ZZ0114F)
Physical Specifications		
Dimension (WxDxH)(mm/in.)		225 × 255 × 33 / 8.86 × 10.04 × 1.30
Item Weight (g/lb)		793 / 1.75
Environmental Specifications		
Temperature	Operation	-40°C to 70°C/-40°F to 158°F
	Storage	-50°C to 80°C/-58°F to 176°F
Humidity	Operation	10% to 95%
	Storage	10% to 90%
IP-rating		IP-67
Wind load		55 m/s

Nebula License Options



Nebula provides flexible options to meet your needs, offering complimentary, enhanced, and advanced cloud networking solutions. Your chosen plan determines the level of service you receive from Nebula Cloud.

Feature Name	Base Pack	Plus Pack	Pro Pack
Unlimited Registration & Central Management (Configuration, Monitoring, Dashboard, Location Map & Floor Plan Visual) of Nebula Devices	•	•	•
Over-the-air Firmware Management	•	•	•
Admin Accounts per Organization (Full Access for Administration Rights)	5	8	No Limit
Advanced Firmware Scheduling (Org/Site/Device)		•	•
Automatic Network Topology (Visual and Actionable)		•	•
Email users and alert Notifications		•	•
Organizational User Audit / Change Logs			•
Backup/Restore Configuration			•
Priority Nebula Support Request (Direct NCC incl. Web Chat)			•

* Search [Nebula Control Center](#) for more Nebula license plan.

Nebula Mobile App



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