

ISTITUTO COMPRENSIVO DI POMARANCE

Codice Progetto 13.1.1A-FESRPN-TO-2021-225

“Cablaggio strutturato e sicuro all’interno degli edifici scolastici”

CIG: 91856172F2

Cup: I59J21004920006

CAPITOLATO TECNICO (riepilogo)

| Q.TÀ | DETTAGLIO FORNITURE |
|------|---|
| 30 | Access Point Ruckus® R350 (o equivalente) 802.11ax dual radio WiFi 6 con controller integrato |
| 5 | Switch 8 porte Gigabit 8 PoE Managed |
| 2 | Switch 48 porte Gigabit/48 PoE Managed |
| 2 | Alimentatore PoE singolo Gigabit AF/AT 15,4/30W |
| 4 | Armadio di rete da 10” 6U – Parete – A33 x L 31,2 x P 30cm COMPLETO |
| 7 | Firewall FortiGate-40F Hardware + 3 anni 24x7 FortiCare&FortiGuard |
| 1 | Firewall FortiGate-60F Hardware + 3 anni 24x7 FortiCare&FortiGuard |
| 8 | Servizi di Installazione/Configurazione degli apparati |

CAPITOLATO TECNICO (dettaglio)

Datasheet con caratteristiche tecniche degli Access Point richiesti

Access Point RUCKUS® R350 Indoor Wi-Fi 6 (802.11ax) dual radio WiFi 6 con controller integrato

| | |
|--------------------------|--|
| Wi-Fi Standards | <ul style="list-style-type: none"> IEEE 802.11a/b/g/n/ac/ax |
| Supported Rates | <ul style="list-style-type: none"> 802.11ax: 4 to 1774 Mbps 802.11ac: 6.5 to 867 Mbps (MCS0 to MCS9, NSS = 1 to 2 for VHT20/40/80) 802.11n: 6.5 Mbps to 300 Mbps (MCS0 to MCS15) 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6Mbps 802.11b: 11, 5.5, 2 and 1 Mbps |
| Supported Channels | <ul style="list-style-type: none"> 2.4GHz: 1-13 5GHz: 36-64, 100-144, 149-165 |
| MIMO | <ul style="list-style-type: none"> 2x2 SU-MIMO 2x2 MU-MIMO |
| Spatial Streams | <ul style="list-style-type: none"> 2 streams SU/MU-MIMO 5GHz 2 streams SU/MU-MIMO 2.4GHz |
| Radio Chains and Streams | <ul style="list-style-type: none"> 2x2:2 (5 GHz) 2x2:2 (2.4GHz) |
| Channelization | <ul style="list-style-type: none"> 20, 40, 80MHz |
| Security | <ul style="list-style-type: none"> WPA-PSK, WPA-TKIP, WPA2 , WPA3-Personal, WPA3- Enterprise, AES, WPA3, 802.11i, Dynamic PSK WIPS/WIDS |
| Other Wi-Fi Features | <ul style="list-style-type: none"> WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v Hotspot Hotspot 2.0 Captive Portal WISPr |

| 2.4GHZ TX POWER TARGET | |
|------------------------|------------|
| Rate | Pout (dBm) |
| MCS0 HT20 | 20 |
| MCS7 HT20 | 15 |

| 5GHZ TX POWER TARGET | |
|----------------------|------------|
| Rate | Pout (dBm) |
| MCS0 VHT20 | 20 |
| MCS7 VHT20 | 17 |
| MCS0 VHT40,VHT80 | 17 |
| MCS7 VHT40, VHT80 | 17 |

| PERFORMANCE AND CAPACITY | |
|--------------------------|--|
| Peak PHY Rates | <ul style="list-style-type: none"> · 2.4GHz: 574Mbps · 5 GHz: 1200Mbps |
| Client Capacity | · Up to 256 clients per AP |
| SSID | · Up to 16 per AP |

| RADIO MANAGEMENT | |
|------------------------------|---|
| Antenna Optimization | <ul style="list-style-type: none"> · BeamFlex+ · Polarization Diversity with Maximal Ratio Combining (PD- MRC) |
| Wi-Fi Channel Management | <ul style="list-style-type: none"> · ChannelFly · Background Scan Based |
| Client Density Management | <ul style="list-style-type: none"> · Adaptive Band Balancing · Client Load Balancing · Airtime Fairness · Airtime-based WLAN Prioritization |
| SmartCast Quality of Service | <ul style="list-style-type: none"> · QoS-based scheduling · Directed Multicast · L2/L3/L4 ACLs |
| Mobility | · SmartRoam |
| Diagnostic Tools | · SpeedFlex |

| RF | |
|--|--|
| Antenna Type | <ul style="list-style-type: none"> · BeamFlex adaptive antennas · Adaptive antenna that provides up to 64 unique antenna patterns per band |
| Antenna Gain (max) | · Up to 3dBi |
| Peak Transmit Power (aggregate across MIMO chains) | <ul style="list-style-type: none"> · 2.4GHz: 23 dBm · 5GHz: 23 dBm |
| Minimum Receive Sensitivity ¹ | · -101 dBm |
| Frequency Bands | <ul style="list-style-type: none"> · ISM (2.4-2.484GHz) · U-NII-1 (5.15-5.25GHz) · U-NII-2A (5.25-5.35GHz) · U-NII-2C (5.47-5.725GHz) · U-NII-3 (5.725-5.85GHz) |

| 2.4GHZ RECEIVE SENSITIVITY (dBm) | | | |
|----------------------------------|------|------|------|
| HT20 | | HT40 | |
| MCS0 | MCS7 | MCS0 | MCS7 |
| -94 | -70 | -91 | -72 |

| 5GHZ RECEIVE SENSITIVITY (dBm) | | | | | |
|--------------------------------|------|-------|------|-------|------|
| VHT20 | | VHT40 | | VHT80 | |
| MCS0 | MCS7 | MCS0 | MCS7 | MCS0 | MCS7 |
| | | | | | |

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| -95 | -76 | -92 | -73 | -89 | -70 |
|-----|-----|-----|-----|-----|-----|

| NETWORKING | |
|-----------------------------|---|
| Controller Platform Support | <ul style="list-style-type: none"> · SmartZone · ZoneDirector · Unleashed2 · Cloud · Standalone |
| Mesh | · SmartMesh™ wireless meshing technology. Self-healing Mesh |
| IP | · IPv4, IPv6 |
| VLAN | <ul style="list-style-type: none"> · 802.1Q (1 per BSSID or dynamic per use based on RADIUS) · VLAN Pooling · Port-based |
| 802.1x | · Authenticator & Supplicant |
| Tunnel | · L2TP, GRE, Soft-GRE |
| Policy Management Tools | <ul style="list-style-type: none"> · Application Recognition and Control · Access Control Lists · Device Fingerprinting · Rate Limiting |

| CERTIFICATIONS AND COMPLIANCE | |
|-------------------------------|--|
| 4 | <ul style="list-style-type: none"> · Wi-Fi CERTIFIED™ a, b, g, n, ac · Wi-Fi CERTIFIED 6™ · WPA3™ -Enterprise, Personal · Wi-Fi Enhanced Open™ · Wi-Fi Agile Multiband™ · Passpoint® · Vantage · WMM |
| Standards Compliance5 | <ul style="list-style-type: none"> · EN 60950-1 Safety · EN 60601-1-2 Medical · EN 61000-4-2/3/5 Immunity · EN 50121-1 Railway EMC · EN 50121-4 Railway Immunity · IEC 61373 Railway Shock & Vibration · UL 2043 Plenum · EN 62311 Human Safety/RF Exposure · WEEE & RoHS · ISTA 2A Transportation |

| SOFTWARE AND SERVICES | |
|-------------------------|---------------------------|
| Location Based Services | · SPoT |
| Network Analytics | · SmartCell Insight (SCI) |
| Security and Policy | · Cloudpath |

| PHYSICAL INTERFACES | |
|---------------------|------------------------|
| Ethernet | · 1 x 1GbE port, RJ-45 |

| | |
|-----|--------------------------|
| USB | · 1 USB 2.0 Port, Type A |
|-----|--------------------------|

| PHYSICAL CHARACTERISTICS | |
|--------------------------|--|
| Physical Size | · 14.60(L) x 15.59(W) x 3.93(H) cm · 5.75(L) x 6.14(W) x 1.55(H) in |
| Weight | · 368g (13 oz) |
| Mounting | · Wall, Drop ceiling, Desk · Secure bracket (sold separately) |
| Physical Security | · Hidden latching mechanism · T-bar Torx |
| Operating Temperature | · 0 °C (32 °F) to 40 °C (104 °F) |
| Operating Humidity | · Up to 95%, non-condensing |

Datasheet con caratteristiche tecniche dei Firewall richiesti

Firewall FortiGate-60F/40F Hardware + 3 anni 24x7 FortiCare & FortiGuard

| Hardware Specifications | |
|-----------------------------------|---|
| GE RJ45 WAN / DMZ Ports | 2 / 1 |
| GE RJ45 Internal Ports | 5 |
| GE RJ45 FortiLink Ports (Default) | 2 |
| Wireless Interface | Single Radio (2.4GHz/5GHz), 802.11 a/b/g/n/ac-W2 |
| USB Ports | 1 |
| Console (RJ45) | 1 |
| Internal Storage | - |

| System Performance — Enterprise Traffic Mix | |
|---|----------|
| IPS Throughput 2 | 1.4 Gbps |
| NGFW Throughput 2, 4 | 1 Gbps |
| Threat Protection Throughput 2, 5 | 700 Mbps |

| System Performance | |
|--|--------------|
| Firewall Throughput (1518 / 512 / 64 byte UDP packets) | 10/10/6 Gbps |
| Firewall Latency (64 byte UDP packets) | 3.3 µs |
| Firewall Throughput (Packets Per Second) | 9 Mpps |
| Concurrent Sessions (TCP) | 700 000 |
| New Sessions/Second (TCP) | 35 000 |
| Firewall Policies | 5000 |
| IPsec VPN Throughput (512 byte) 1 | 6.5 Gbps |
| Gateway-to-Gateway IPsec VPN Tunnels | 200 |
| Client-to-Gateway IPsec VPN Tunnels | 500 |
| SSL-VPN Throughput | 900 Mbps |
| Concurrent SSL-VPN Users (Recommended Maximum, Tunnel Mode) | 200 |

| | |
|---|---|
| SSL Inspection Throughput (IPS, avg. HTTPS) | 630 Mbps |
| SSL Inspection CPS (IPS, avg. HTTPS) | 400 |
| SSL Inspection Concurrent Session (IPS, avg. HTTPS) | 55 000 |
| Application Control Throughput (HTTP 64K) | 1.8 Gbps |
| CAPWAP Throughput (HTTP 64K) | 8 Gbps |
| Virtual Domains (Default / Maximum) | 10 / 10 |
| Maximum Number of FortiSwitches Supported | 16 |
| Maximum Number of FortiAPs (Total / Tunnel Mode) | 64 / 32 |
| Maximum Number of FortiTokens | 500 |
| High Availability Configurations | Active-Active, Active-Passive, Clustering |

| | |
|-------------------------|---------------------------------------|
| Radio Specifications | |
| Multiple User (MU) MIMO | 3x3 |
| Maximum Wi-Fi Speeds | 1300 Mbps @ 5 GHz, 450 Mbps @ 2.4 GHz |
| Maximum Tx Power | 20 dBm |
| Antenna Gain | 3.5 dBi @ 5 GHz, 5 dBi @ 2.4 GHz |

Datasheet con caratteristiche tecniche degli switch richiesti

Switch 8 porte Gigabit | 8 PoE - GS1920-8HPv2

Model GS1920-8HPv2
 Product name 8-port GbE Smart Managed PoE Switch
 Switch class Smart Managed

Port Density

Total port count 10
 100/1000 Mbps 8
 Gigabit Combo
 (RJ-45/SFP) 2

PoE

PoE ports 8
 Total PoE budget (Watts) 130
 High power PoE 802.3at Yes

Performance

Switching capacity (Gbps) 20

| | |
|------------------------|--------------|
| Forwarding rate (Mpps) | 15 |
| Packet buffer (byte) | 1.5 M |
| address table | 16 K |
| Flash/RAM | 32 MB/256 MB |

Datasheet con caratteristiche tecniche degli armadi rack richiesti

Armadio a Rack di Rete da 10 Pollici 6U - Montaggio a Parete

- Alloggiamento a parete da 10 pollici con porta a vetri
- Progettato per il cablaggio e l'installazione di vari componenti ed accessori
- Compatto e adatto all'uso di numerosi prodotti e applicazioni della gamma da 10 pollici
- Dimensioni: 310 x 312 x 300 mm

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Il progettista

Prof. Alessandro Salvini

