

AMR NETWORK INFRASTRUCTURE REQUIREMENTS

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Owner: NaviFloor Robotics, Inc.

1. PURPOSE AND SCOPE

1. This document specifies the mandatory network infrastructure requirements for the deployment of Autonomous Mobile Robots (AMRs) in a warehouse environment.

2. These requirements apply to all customer facilities implementing Na

2. NETWORK ARCHITECTURE REQUIREMENTS

1. Primary Network Infrastructure

-

Dedicated VLAN for AMR operations

-

Minimum 1Gbps network backbone

-

IEEE 802.1Q VLAN tagging support

-

Quality of Service (QoS) capabilities for real-time traffic prioritization

-

IPv6 compatibility with dual-stack support

2. Wireless Network Specifications

-

IEEE 802.11ac Wave 2 or newer

-

Minimum -65dBm RSSI throughout operational areas

-

Maximum 2% packet loss rate

-

Channel width: 40MHz minimum

-

Wireless controller redundancy with N+1 configuration

3. Coverage Requirements

-

Minimum 30% overlap between adjacent access points

- - 3 -

Maximum -67dBm signal strength at cell edges

-

Complete coverage of operational areas including charging stations

-

Seamless roaming with 802.11r Fast BSS Transition support

3. SECURITY REQUIREMENTS

1. Network Security

-

WPA3-Enterprise authentication

-

802.1X authentication for all AMR devices

-

Dedicated RADIUS server for AMR authentication

-

Network segmentation with strict access control lists

-

Regular security audits and penetration testing

2. Data Protection

-

End-to-end encryption for all AMR communications

-

TLS 1.3 or higher for management traffic

-

Secure key storage and rotation procedures

-

Regular backup of configuration data

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Encrypted storage of mapping and navigation data

4. PERFORMANCE REQUIREMENTS

1. Network Performance

-

Maximum latency: 20ms within local network

-

Jitter: < 5ms

-

Minimum bandwidth per AMR: 2Mbps sustained

-

Network availability: 99.99% uptime

-

Maximum failover time: 50ms

2. System Monitoring

-

SNMP v3 monitoring capabilities

-

Real-time performance metrics collection

-

Automated alerting system

-

Historical performance data retention

-

Network analytics dashboard access

5. HARDWARE SPECIFICATIONS

1. Network Equipment

-

Enterprise-grade switches with PoE+ capability

-

Redundant power supplies

-

Hot-swappable components

-

Industrial-grade access points (IP67 rated where applicable)

-

Temperature-hardened equipment for industrial environments

2. Server Infrastructure

-

Dedicated physical or virtual servers for NaviFleet(TM) platform

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Minimum 16-core processors

-

64GB RAM minimum

-

RAID 10 storage configuration

-

Redundant power and cooling systems

6. IMPLEMENTATION REQUIREMENTS

1. Pre-deployment Assessment

-

Site survey with RF mapping

-

Network capacity planning

-

Infrastructure upgrade assessment

-

Security vulnerability assessment

-

Integration point identification

2. Installation Procedures

-

Professional installation by certified technicians

-

Compliance with local electrical codes

-

Documentation of all network configurations

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Performance baseline establishment

-

User acceptance testing

7. MAINTENANCE AND SUPPORT

1. Regular Maintenance

-

Quarterly network performance reviews

-

Monthly security patches and updates

-

Regular firmware updates

-

Preventive maintenance schedule

-

Configuration backup procedures

2. Support Requirements

-

24/7 technical support availability

-

Maximum 4-hour response time for critical issues

-

Remote monitoring and diagnostics

-

Regular system health checks

-

Incident response procedures

8. COMPLIANCE AND DOCUMENTATION

1. Required Documentation

-

Network topology diagrams

-

Configuration management database

-

Security compliance reports

-

Performance monitoring logs

-

Incident response documentation

2. Regulatory Compliance

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NIST Cybersecurity Framework adherence

-

ISO 27001 compliance where applicable

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Industry-specific regulatory requirements

-

Data privacy compliance

-

Environmental safety standards

9. DISCLAIMER

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10. DOCUMENT CONTROL

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