MyQ X Security 10.x

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MyQ X Security Features Overview

MyQ X provides a range of features to enhance the security and privacy of end-users and of the company as well. These features start with secure printing at the MFD, customization of the user session, and have a continuous impact even after a document has been printed with the help of watermarks.

Here is a short summary of the MyQ X Security features:

- GDPR compliance
- Secure print
- User sessions with multiple authentication options including two-factor authentication
- Manual and automatic logout from user sessions
- End-to-end data encryption including data at rest encryption (database, jobs, logs)
- Fixed scan destination folders predefined by the MyQ administrator
- Private queues for deleting of print jobs immediately after release
- Privacy mode for anonymizing names of print job
- Restricted access to the setup options of the print server on the MyQ X Web Interface
- Customizable rights for access to different setup options
- Multiple levels of password complexity
- Audit log for changes of settings
- Support for company certificate authority
- Watermarking printed documents
- Job preview
- Controlling scanned documents via OCR and DMS systems
- Job archiving

MyQ X's security approach is founded on the principle that **security is not an afterthought but an integral part of the entire print management ecosystem**. The platform implements a comprehensive defense strategy that protects data and workflows at every stage of the document lifecycle.

1 Zero Trust Architecture

Following the "never trust, always verify" methodology, MyQ X assumes that threats can exist both inside and outside of a network. Every connection, user, and device must be authenticated and authorized before accessing print resources, ensuring continuous verification throughout all interactions.

2 Three-Phase Protection Framework

MyQ X addresses security through three critical phases:

2.1 Securing Print Infrastructure

All supporting infrastructure is properly secured before any document is printed, including workstations, mobile devices, servers, networks, and printing devices.

2.2 Securing Print Workflows

Proven secure workflows including authenticated print release, job isolation, and comprehensive reporting prevent vulnerabilities that could leave organizations exposed.

2.3 Securing Printed Output

Continued protection through watermarking, digital signatures, and comprehensive audit logs that maintain traceability and encourage responsible user behavior.

3 Privacy by Design

Data protection is embedded into MyQ X's architecture from the ground up. The system minimizes data collection, implements strong encryption, and provides users with control over their personal information to ensure GDPR compliance and privacy protection.

4 Continuous Security Evolution

MyQ X maintains its security through regular updates, prompt vulnerability remediation, threat intelligence integration, and ongoing third-party security assessments and certifications.

This security-first approach ensures organizations can confidently deploy MyQ X knowing their sensitive information, compliance requirements, and operational continuity are protected by industry-leading security measures.

5 Key Security Improvements in 10.2

MyQ X 10.2 introduces significant security enhancements designed to strengthen protection against evolving cyber threats while maintaining operational efficiency. These improvements address critical vulnerabilities and implement modern security standards.

5.1 Enhanced TLS Security

Default TLS 1.2 Minimum Version: MyQ X 10.2 increases the default minimum TLS version from 1.1 to 1.2, with support for TLS 1.3. This eliminates support for deprecated SSL protocols and weak ciphers that pose security risks.

Improved Certificate Validation: Enhanced certificate validation prevents the use of expired or improperly issued certificates, protecting against man-in-the-middle attacks and other vulnerabilities. The system now automatically trusts Root CA certificates from the server's system certificate store.

5.2 Authentication Security Enhancements

Enhanced Password and PIN Security: Improved password hashing algorithms strengthen credential protection. The system introduces new PIN security rules, including mandatory 6-digit minimum length and prevention of easily guessable combinations like "1234" or "1111".

Login Attempt Protection: Unsuccessful authentication attempts are now limited for security reasons. By default, clients/devices are blocked for 5 minutes after more than 5 invalid login attempts within 60 seconds, with configurable time periods.

Improved Login Event Logging: Enhanced logging of login events, especially failed authentication attempts, makes filtering and monitoring security events in MyQ Log easier for administrators.

5.3 Database Security Upgrades

Firebird 4.0 Implementation: Upgrade to Firebird 4.0 database engine brings enhanced security features and improved performance. Database passwords are now obfuscated in log files to prevent credential exposure.

Enhanced Data Protection: Limited access to sensitive data through custom reports and external reporting accounts, ensuring data confidentiality across different access levels.

5.4 Vulnerability Resolution

Critical CVE Fixes: MyQ X 10.2 addresses multiple critical vulnerabilities including:

- CVE-2024-28059: Unauthenticated Remote Code Execution vulnerability.
- CVE-2024-22076: PHP Scripting security improvements.
- CVE-2023-45853, CVE-2023-5678, CVE-2023-49316: Third-party component vulnerabilities.

Component Security Updates: Updated versions of critical components including OpenSSL 3.1.0, PHP 8.3.14, and Apache 2.4.57 address known security vulnerabilities.

5.5 API and Integration Security

REST API Restrictions: Limited scopes for well-known clients and removed capabilities for sensitive operations like changing user authentication servers, strengthening API security.

PHP Scripting Controls: New Easy Config settings allow administrators to lock/unlock PHP scripting access, improving security by maintaining these settings in read-only mode.

5.6 Administrative Security

Enhanced Admin Account Security: Default admin password has been removed for new installations. Administrators can now disable admin accounts when not needed, promoting the use of specific user accounts with appropriate rights rather than shared administrative accounts.

These security improvements demonstrate MyQ X's commitment to maintaining enterprise-grade security standards while addressing contemporary cybersecurity challenges. Regular security updates and proactive vulnerability management ensure organizations can deploy MyQ X with confidence in their security.

6 Business Value of Secure Print Management

Secure print management delivers measurable business value by transforming print infrastructure from a potential liability into a strategic security asset. MyQ X provides organizations with comprehensive protection that addresses the full spectrum of print-related risks while enhancing operational efficiency.

6.1 Risk Mitigation and Cost Reduction

Data Breach Prevention: Secure Print Release ensures confidential documents are never left unsupervised in printer trays, eliminating unauthorized access to sensitive information. Users authenticate before their jobs are released, maintaining complete control over document security.

Compliance Cost Avoidance: Built-in GDPR, HIPAA, and SOX compliance capabilities help organizations avoid regulatory penalties and reduce audit preparation costs through automated compliance controls and comprehensive audit trails.

Operational Continuity: MyQ's Device Spooling feature maintains printing capabilities during server outages, storing encrypted jobs locally for up to one week across 10 devices, preventing business disruption during system maintenance or unexpected downtime.

6.2 Enhanced Security Principles

Zero Trust Implementation: By requiring authentication for every print job, MyQ X enforces "never trust, always verify" principles throughout the print environment, strengthening overall organizational security posture.

Document Traceability: Watermarking and digital signatures enable organizations to track confidential documents throughout their lifecycle, providing accountability and deterring misuse of sensitive information.

Comprehensive Encryption: End-to-end encryption of print data, databases, and stored jobs ensures sensitive information remains protected throughout the entire document workflow, meeting stringent security requirements.

6.3 Operational Efficiency

Bandwidth Optimization: Client Spooling reduces network traffic by processing jobs locally, improving performance in bandwidth-constrained environments such as remote offices and branch locations.

Flexible Authentication: Multiple authentication options including ID cards, PINs, passwords, and mobile app authentication provide users with convenient yet secure access methods that fit diverse organizational needs. Multi-Factor Authentication (MFA), combining these methods, is also available.

Centralized Management: Unified security policies across all devices simplify administration while ensuring consistent protection standards throughout the organization.

6.4 Strategic Business Benefits

Competitive Advantage: Demonstrating robust print security capabilities can differentiate organizations in competitive markets, particularly in industries handling sensitive data or serving security-conscious clients.

Employee Confidence: Secure print workflows give users confidence that their documents are protected, improving productivity and reducing security-related concerns that can impact workplace efficiency.

Future-Ready Infrastructure: MyQ X's comprehensive security framework positions organizations to adapt to evolving cybersecurity threats and regulatory requirements without major infrastructure overhauls.

Secure print management with MyQ X transforms printing from a potential security vulnerability into a controlled, auditable, and compliant business process that supports organizational goals while protecting valuable information assets.

7 Compliance

MyQ X's comprehensive compliance framework demonstrates its commitment to meeting the highest international security standards and regulatory requirements. This multi-layered approach ensures organizations can confidently deploy MyQ X while satisfying diverse compliance mandates across industries and jurisdictions.

7.1 ISO 27001:2022 Certification and Implementation

MyQ has achieved **ISO/IEC 27001:2022 certification**, establishing a systematic approach to information security management that meets international best practices. The implementation encompasses:

Risk Management Framework: Comprehensive risk assessment processes that identify, evaluate, and mitigate information security risks across all business operations and customer deployments.

Security Controls Implementation: Structured deployment of technical, administrative, and physical security controls that protect information assets throughout their lifecycle.

Continuous Improvement Process: Regular reviews and updates of security policies, procedures, and controls to address evolving threats and maintain certification compliance.

Management Commitment: Executive-level oversight ensuring security remains integrated into business strategy and operational decision-making processes.

The certification validates MyQ's systematic approach to protecting customer data and maintaining the confidentiality, integrity, and availability of information systems.

7.2 GDPR Compliance Framework and Data Protection Measures

MyQ X implements comprehensive **GDPR compliance** through privacy-by-design principles embedded throughout the system architecture:

Data Minimization: The system collects only essential metadata required for operational functionality, avoiding unnecessary personal data processing that could increase compliance risks.

User Rights Management: Complete implementation of GDPR user rights including:

- Right of access to personal data
- Right to rectification of inaccurate information

- Right to erasure ("right to be forgotten")
- Right to data portability
- Right to restrict processing

Data Protection Impact Assessments: Systematic evaluation of privacy risks for new features and deployments, ensuring GDPR compliance is maintained throughout system evolution.

7.3 Regional Compliance Requirements (HIPAA, SOX)

MyQ X supports critical industry-specific compliance frameworks through robust data protection and audit capabilities:

HIPAA Compliance for Healthcare:

- Encryption of Protected Health Information (PHI) at rest and in transit.
- Comprehensive audit logging of all access to sensitive health data.
- Role-based access controls restricting PHI access to authorized personnel only.
- Secure backup and recovery procedures for healthcare data retention requirements.

SOX Compliance for Financial Services:

- Detailed audit trails for financial document processing and printing.
- Access controls preventing unauthorized modification of financial records.
- Secure archival capabilities supporting regulatory retention requirements.
- Segregation of duties through role-based permissions and approval workflows.

Additional Security Controls:

- Database encryption using industry-standard algorithms.
- Secure communication protocols for all data transmission.
- Automated backup procedures with encryption and integrity verification.
- Access logging and monitoring for compliance reporting.

7.4 Secure Software Development Lifecycle (SSDLC) Practices

MyQ implements a Secure Software Development Life Cycle aligned with industry standards and **SLSA** supply-chain requirements, ensuring that security practices are embedded across all phases of the software lifecycle.

Analysis

MyQ performs rigorous **Threat Modeling** and defines clear **Security Requirements** during the initial analysis phase, enabling early risk identification and establishing a strong security baseline before design begins.

Design

All architectural proposals undergo formal **Security Architecture Reviews** to validate adherence to principles like **Least Privilege**, **Zero Trust**, and **Defense in Depth**, ensuring that security is systematically embedded into system design.

Development

Developers follow **Secure Coding Practices** and peer-review processes while all builds run on dedicated, isolated **SLSA-compliant Build Servers**, ensuring protection of source integrity and build artifacts.

Testing

Security testing includes automated **SAST** and **Dependency Scanning** integrated into CI pipelines, enabling early detection of vulnerabilities in both custom code and third-party components.

Deployment

All release artifacts are protected through **Code Signing** and verified during deployment, ensuring **Integrity**, **Authenticity**, and controlled delivery into production environments.

Maintenance

Post-deployment, systems undergo continuous **Monitoring** and structured **Patch Management**, ensuring ongoing alignment with evolving threats and **Security Best Practices**.

7.5 Regular Security Audits and Penetration Testing

MyQ maintains robust security validation through systematic testing and assessment programs:

Automated Penetration Testing: Integration with Qualys security platform provides continuous vulnerability assessment and penetration testing for all software releases.

Third-Party Security Assessments: Independent security audits conducted by qualified external organizations to validate security controls and identify potential improvements.

Internal Security Reviews: Regular internal assessments of security policies, procedures, and technical controls to ensure continued effectiveness and compliance.

Vulnerability Response Process: Structured procedures for addressing identified security issues, including timeline requirements for patch development and deployment.

7.6 Software Bill of Materials and Vulnerability Management

MyQ implements comprehensive supply chain security through detailed component tracking and vulnerability management:

SBOM Publication: Complete Software Bill of Materials documentation identifying all third-party components, libraries, and dependencies used in MyQ X systems.

Automated Vulnerability Scanning: Continuous monitoring of component databases for newly identified vulnerabilities affecting MyQ X dependencies.

Rapid Patch Management: Systematic process for evaluating, testing, and deploying security updates for third-party components, with prioritization based on risk assessment.

Component Version Control: Detailed tracking of all software components including version numbers, security patch levels, and update schedules as documented in release notes.

Supplier Security Assessment: Evaluation of third-party software suppliers to ensure they maintain appropriate security standards and vulnerability disclosure processes.

This comprehensive compliance framework ensures MyQ X meets diverse regulatory requirements while maintaining the highest standards of information security and data protection across all operational environments.

8 Zero Trust Architecture Implementation

MyQ X implements Zero Trust Architecture as a foundational security approach that eliminates implicit trust and continuously validates every transaction. This comprehensive framework ensures that no user, device, or network connection is trusted by default, regardless of their location or previous authentication status.

8.1 Zero Trust Principles in Print Management

MyQ X's Zero Trust implementation is built on the principle of **"never trust, always verify"** throughout the entire print management system. The system requires explicit verification for every access request, ensuring that:

Encrypted Communication Channels: All network traffic utilizes mandatory TLS encryption with minimum version 1.2, preventing eavesdropping and tampering during data transmission. HTTPS certificates must be properly configured and validated to prevent man-in-the-middle attacks.

Secure Protocol Enforcement: MyQ X blocks unencrypted HTTP traffic and enforces strong security protocols across all communication channels, including SMTP, LDAP, and SNMP connections. Legacy protocols like SNMPv1 are prohibited in favor of SNMPv3 with strong authentication.

API Security Controls: REST API access requires authentication tokens with IP address filtering, ensuring that API calls are both authenticated and originate from trusted sources. Client secrets undergo periodic rotation to maintain security integrity.

8.2 "Never Trust, Always Verify" Methodology

The Zero Trust methodology permeates every aspect of MyQ X operations through continuous verification mechanisms:

Identity Verification: Every user interaction requires authentication, regardless of network location or device trust status. Users must authenticate at each print device, even if they have previously logged in elsewhere in the organization.

Device Authentication: Print devices themselves must authenticate before accessing network resources, with unique credentials and certificates preventing unauthorized device spoofing.

Session Management: User sessions implement automatic timeout and logout functionality, ensuring that abandoned sessions cannot be exploited by unauthorized individuals.

8.3 Segmentation and Network Isolation

MyQ X implements comprehensive network segmentation to limit attack surfaces and contain potential security breaches:

Network Boundary Controls: The system enforces strict firewall rules that block unused ports and limit network access to only necessary communication channels. Default configurations disable unnecessary services and protocols.

Certificate-Based Segmentation: MyQ X supports three certificate management modes - Built-in Certificate Authority, Company Certificate Authority, and Manual Certificate Management - allowing organizations to implement appropriate trust boundaries based on their security policies.

FQDN Enforcement: All network communications must use fully qualified domain names (FQDN) rather than IP addresses or single-label names, preventing DNS-based man-in-the-middle attacks and ensuring proper certificate validation.

Port Management: The system automatically manages firewall rules and provides explicit control over which network ports are accessible, reducing the attack surface through systematic port blocking.

8.4 Robust Authentication and Verification

MyQ X maintains continuous security validation through multiple authentication layers and real-time monitoring:

Multi-Method Authentication: The system supports diverse authentication methods including LDAP, Microsoft Entra ID, RADIUS, and local MyQ authentication, with automatic failover capabilities ensuring continuous access control.

Authentication Server Integration: Secure integration with external authentication servers uses encrypted connections (TLS for LDAP, secure protocols for RADIUS) and enforces strong shared secrets specific to each MyQ deployment.

Login Monitoring: Enhanced logging of authentication events, particularly failed login attempts, enables administrators to detect and respond to potential security threats. Unsuccessful authentication attempts trigger automatic blocking mechanisms - by default, devices are blocked for 5 minutes after more than 5 invalid attempts within 60 seconds.

Session Persistence Controls: The system implements configurable session timeout policies and automatic logout functionality, ensuring that inactive sessions cannot be exploited.

8.5 Device and Endpoint Verification

MyQ X enforces strict device verification protocols to ensure only authorized endpoints can access print resources:

Device Certificate Management: All connected devices must present valid certificates for network communication. The system maintains a comprehensive certificate store with proper chain validation and supports automatic certificate deployment via Group Policy or Mobile Device Management (MDM).

Endpoint Security Controls: Print devices undergo continuous security validation, including SNMP v3 authentication with strong passwords and cryptographic algorithms (SHA1 and AES). Printer credentials are managed through vendor-specific security protocols with randomly generated strong passwords.

Mobile Device Authentication: MyQ X Mobile Client implements OAuth 2.0 Device Authorization Grant for secure mobile device authentication, replacing legacy PIN-based systems with modern biometric-enabled security.

BYOD Security Framework: The system supports Bring-Your-Own-Device (BYOD) environments through secure print propagation via AirPrint and Mopria, maintaining zero-trust principles even in networks with no direct print server visibility.

Access Token Management: Unique access tokens are issued for each device type, with Transport Layer Security (TLS) mandatory for all communications. The system implements Just-in-Time (JIT) access controls that dynamically adjust privileges based on context and continuous risk assessment.

This comprehensive Zero Trust implementation ensures that MyQ X maintains the highest security standards while supporting diverse organizational needs and deployment scenarios. The architecture provides defense-in-depth protection that adapts to evolving threat landscapes while maintaining operational efficiency and user experience.

9 Identity and Access Management

MyQ X provides a comprehensive Identity and Access Management framework that integrates seamlessly with existing enterprise authentication systems while supporting modern security standards. The IAM architecture ensures secure, scalable, and flexible user authentication across diverse organizational environments.

9.1 Multi-Factor Authentication Implementation

MyQ X implements robust **multi-factor authentication (MFA)** capabilities that significantly enhance security by requiring multiple verification factors:

Embedded Terminal Authentication: Standard MFA methods include ID Card and PIN combinations, where users first present their physical ID card and then confirm their identity with a PIN code. Alternatively, ID Card and Password authentication provides similar two-factor security with password verification instead of PIN.

Mobile-Based Authentication: The MyQ X Mobile Client enables sophisticated MFA through QR code scanning combined with biometric verification. Users authenticate by scanning a QR code displayed on the embedded terminal, with additional security provided through biometric locks (Face ID or fingerprint) on their mobile devices.

Desktop Client Integration: Organizations using Microsoft 365 services benefit from integrated MFA through Entra ID authentication. Users with two-factor authentication enabled in their Entra ID accounts are automatically prompted to verify their identity using authenticator applications when accessing the Desktop Client.

9.2 OAuth 2.0 Device Authorization Grant

MyQ X supports the **OAuth 2.0 Authorization Code Grant** standard, enabling secure integration with modern identity providers and third-party applications:

Standard OAuth Flow: The system implements the complete OAuth 2.0 authorization framework including login page presentation, one-time access code generation, and secure token retrieval. Client applications receive bearer tokens with configurable expiration times and granted scopes.

API Integration Security: OAuth tokens must be provided for all API endpoint access, ensuring that third-party integrations maintain proper authentication. The system supports client ID and client secret validation with secure redirect URI matching.

Token Management: Access tokens include expiration controls (default 1800 seconds) and scope restrictions, providing granular control over API access permissions while maintaining security through token rotation.

9.3 Single Sign-On Integration Capabilities

MyQ X provides comprehensive **Single Sign-On (SSO)** integration that streamlines user authentication across enterprise environments:

Microsoft 365 Integration: Deep integration with Microsoft Entra ID enables seamless SSO for organizations using Microsoft 365 services. Users can authenticate using their existing Microsoft credentials, eliminating the need for separate MyQ passwords.

Enterprise Directory Services: SSO capabilities extend to various authentication servers including Active Directory, OpenLDAP, and Novell eDirectory, allowing users to leverage existing enterprise credentials for MyQ access.

Cross-Platform Authentication: SSO functionality works across all MyQ X components including Desktop Client, Mobile Client, and embedded terminals, providing consistent authentication experiences regardless of access method.

9.4 Role-Based Access Control (RBAC)

MyQ X implements sophisticated **Role-Based Access Control** that aligns with enterprise security requirements:

Granular Permission Management: The system provides detailed control over user permissions, allowing administrators to define specific access rights based on organizational roles and responsibilities.

Group-Based Administration: RBAC implementation supports both individual user permissions and group-based access control, enabling efficient management of large user populations through security group assignments.

Least Privilege Enforcement: Access controls follow the principle of least privilege, ensuring users receive only the minimum permissions necessary for their job functions while maintaining operational efficiency.

9.5 Entra ID Multi-Tenant Support

MyQ X provides robust support for **Microsoft Entra ID multi-tenant environments**:

Cross-Tenant Authentication: The system can authenticate users across multiple Entra ID tenants, supporting complex organizational structures with multiple Azure AD instances.

Tenant Isolation: Multi-tenant support includes proper isolation mechanisms that prevent cross-tenant data access while maintaining centralized MyQ management capabilities.

Hybrid Identity Management: Integration supports both cloud-only and hybrid identity scenarios, accommodating organizations with on-premises Active Directory synchronized to Entra ID.

9.6 LDAP and Active Directory Integration

MyQ X offers comprehensive **LDAP and Active Directory integration** capabilities:

Flexible Synchronization Options: The system supports multiple synchronization methods including full synchronization, selective attribute synchronization, and conditional synchronization based on LDAP filters. Administrators can choose between full replacement, add-only, or conditional updates for card and PIN properties.

Advanced Filtering Capabilities: LDAP synchronization includes sophisticated filtering options using standard LDAP filter syntax, enabling selective user import based on organizational units, group memberships, or custom attributes.

Group Structure Import: The system can import complete organizational structures including security groups, distribution groups, and nested group hierarchies from Active Directory, maintaining organizational relationships within MyQ.

Secure Authentication: All LDAP communications utilize TLS encryption to protect credentials and user data during synchronization. The system supports both traditional LDAP over TLS and secure LDAP connections.

9.7 Temporary PIN Management and Security Policies

MyQ X implements comprehensive **PIN management and security policies**:

Enhanced PIN Security: Version 10.2 introduces strengthened PIN security including mandatory 6-digit minimum length and prevention of easily guessable combinations such as "1234" or "1111".

Temporary PIN Issuance: The system supports temporary PIN codes that can be issued for specific time periods or single-use scenarios, providing additional security for guest access or temporary employees.

PIN Policy Enforcement: Configurable PIN policies allow organizations to define complexity requirements, expiration periods, and reuse restrictions that align with corporate security standards.

Failed Authentication Protection: Enhanced security includes automatic blocking of authentication attempts after repeated failures (default: 5 minutes blocking after 5 failed attempts within 60 seconds).

9.8 Biometric Authentication Support

MyQ X leverages modern **biometric authentication capabilities** through mobile device integration:

Mobile Biometric Integration: The MyQ X Mobile Client supports biometric authentication methods including Face ID on iOS devices and fingerprint recognition on Android devices, providing seamless yet secure access control.

Multi-Modal Authentication: Biometric authentication works in conjunction with device-based security, creating a multi-modal authentication system that combines something the user has (mobile device) with something they are (biometric characteristics).

10 Infrastructure Security

MyQ X provides robust infrastructure security that protects the entire print management environment from evolving cyber threats. The platform incorporates multiple layers of defense to safeguard servers, databases, network communication, and software integrity, ensuring operational reliability and data confidentiality.

10.1 Print Server Security Hardening

MyQ X print servers are hardened using best practice security configurations defined in the **config.ini** settings, including:

- Restriction of services and processes to limit attack surface.
- Enabling secure communication protocols and disabling legacy insecure options.
- Strict user privilege assignment, avoiding administrator privileges where unnecessary.
- Regular automatic updates and security patching to address newly discovered vulnerabilities.
- Configuration of firewall rules and port restrictions to block unauthorized network traffic.

These measures reduce the risk of exploitation and maintain system availability even under attack conditions.

10.2 Database Encryption (Firebird 4.0 Implementation)

MyQ X uses the **Firebird 4.0** database engine, which provides advanced encryption capabilities to protect sensitive data at rest and during backup operations. Key encryption features include:

- AES-256 encryption of database files to prevent unauthorized data access.
- Encrypted storage of passwords and keys within the database system.
- Obfuscation of sensitive database content in logs and diagnostics.

This ensures compliance with data protection regulations and prevents compromise of print job accounting and user information.

10.3 TLS 1.2/1.3 Enforcement and Certificate Management

To protect data in transit, MyQ X enforces a minimum **TLS 1.2** protocol by default, with optional upgrade to TLS 1.3 for enhanced security and performance. The platform supports flexible certificate management modes:

- Automatic generation of a private root Certificate Authority (CA) that signs server and client certificates.
- Integration of organization-managed intermediate CAs, allowing corporate trust chains and centralized certificate control.
- Support for manual certificate installation, including third-party/public CA certificates.

Certificates and private keys are securely stored with encrypted protection, and clients receive trusted certificates via Group Policy or Mobile Device Management.

10.4 Network Communication Security

MyQ X secures all network communication channels by:

- Blocking all unencrypted HTTP traffic, enforcing HTTPS only.
- Encrypting SMTP, LDAP, and RADIUS traffic using TLS to protect authentication and mail flow.
- Disabling deprecated and vulnerable protocols such as POP3 and STARTTLS replacements.
- Employing SNMPv3 with strong authentication and cryptographic algorithms to securely monitor and manage devices.

These controls prevent eavesdropping, spoofing, and man-in-the-middle attacks across the network.

10.5 Firewall Configuration and Port Management

MyQ X reduces attack surfaces by:

- Disabling firewall rules for unused network ports and protocols.
- Allowing granular control of which ports are exposed based on organizational network policies.

This limits ingress points to only those essential for print services, enhancing perimeter defenses.

10.6 API Security and Authentication Tokens

APIs enforce multiple layers of security:

- OAuth 2.0 Authorization Code Grant framework secures API access through short-lived bearer tokens and scope restrictions.
- Tokens are validated against client IP addresses and require secure client credentials.
- Periodic secret rotations protect against credential leaks.

This guards API endpoints against unauthorized requests and abuse.

10.7 Process Isolation and Sandboxing

MyQ X print management applications run with **process isolation** to prevent compromised components from affecting the entire system. Virtual machine or containerized sandboxing is employed where feasible to contain security breaches and limit lateral movement within the environment.

10.8 Code Signing and Integrity Verification

All MyQ software binaries and installers are **code signed** to guarantee authenticity and integrity. This ensures that customers install verified software versions free from tampering or unauthorized modification.

11 Data Protection and Encryption

MyQ X implements comprehensive data protection and encryption throughout the entire document lifecycle, ensuring confidentiality and integrity from initial print submission through final output and archival.

11.1 End-to-End Encryption Implementation

MyQ X provides **end-to-end encryption** across all communication channels and data storage points:

Encrypted Communication Channels: All network traffic utilizes mandatory TLS encryption with minimum version 1.2 by default. HTTPS is enforced for all web interfaces, server-to-server communication, and client connections.

Certificate-Based Security: Multiple certificate management modes support organizational requirements, from built-in Certificate Authority to corporate PKI integration and public CA certificates. Private keys are protected by randomly generated passwords stored in encrypted form within the Firebird database.

Protocol Security: TLS encryption is enforced across SMTP, LDAP, RADIUS, and SNMP protocols, ensuring no sensitive data is transmitted in clear text.

11.2 Data at Rest Encryption

MyQ X protects stored data through multiple encryption layers:

Database Encryption: The Firebird 4.0 database supports encryption using custom certificates with "Encrypting File System" Enhanced Key Usage (EKU). Certificates must be located in designated computer certificate stores, with the Personal store being preferred.

File System Protection: Print and scan job files stored on the MyQ X Print Server can be encrypted using custom certificates provided by administrators, adding an additional layer of protection beyond file system permissions.

Full Disk Encryption: MyQ X supports integration with full disk encryption technologies like Microsoft BitLocker to protect all data at rest on the print server, including the database, certificates, and temporary files.

11.3 Data in Transit Protection (TLS Encryption)

MyQ X enforces strict **TLS encryption standards** for all network communication:

Minimum TLS 1.2: Default configuration requires TLS 1.2 minimum, with optional upgrade to TLS 1.3 for enhanced security and performance. Legacy protocols including SSL and older TLS versions are blocked.

Cipher Suite Management: The system implements strong cipher suites and disables vulnerable algorithms to prevent cryptographic attacks. SNMPv3 communications use SHA1 and AES encryption.

Certificate Validation: All TLS connections require proper certificate validation using fully qualified domain names (FQDN) to prevent man-in-the-middle attacks. START TLS is avoided due to MITM vulnerabilities.

11.4 Print Job Encryption and Secure Storage

MyQ X provides multiple mechanisms to protect print jobs throughout their lifecycle:

Secure Print Release: Print jobs are stored securely on the MyQ Server until users authenticate at the device, preventing unauthorized access to documents sitting in printer output trays.

Job File Encryption: Administrators can enable job encryption by providing custom certificates, ensuring print job files remain encrypted while stored on the server awaiting release.

Private Queues: For highly confidential documents, private queues automatically delete print jobs immediately after release, eliminating the risk of prolonged unauthorized access.

Privacy Mode: When enabled, privacy mode masks document names from all users except the document owner, preventing information disclosure through job names. Even administrators cannot view job names from other users.

11.5 Database Encryption Enhancements

The **Firebird 4.0** database implementation provides advanced encryption capabilities:

Custom Certificate Encryption: Database files are encrypted using certificates with EFS Extended Key Usage, providing strong protection against unauthorized database access.

Password Protection: Database passwords are obfuscated in log files, preventing credential exposure during troubleshooting and monitoring activities.

Permission Hardening: The MyQ data folder, containing the user database and TLS certificate private keys, is restricted to Administrators, SYSTEM, and the MyQ service account only, removing default read access for all users.

11.6 Backup Encryption and Secure Storage

MyQ X ensures backups maintain the same security level as production data:

Encrypted Backups: Database backups are protected by secure, randomly generated passwords that prevent unauthorized restoration or access to backup files.

Secure Backup Storage: Backup files should be stored in secured locations with appropriate access controls and encryption at rest to maintain data confidentiality during the backup lifecycle.

11.7 Key Management and Rotation Policies

MyQ X implements secure key management practices:

Certificate Rotation: Certificates can be regularly rotated according to organizational security policies, with support for automated deployment via Group Policy or Mobile Device Management.

Private Key Protection: All private keys for certificates and CA operations are protected by randomly generated passwords stored in encrypted form within the database.

API Secret Rotation: REST API client secrets should undergo periodic rotation to maintain security. The system supports secret rollover without service interruption.

11.8 Data Minimization and Privacy by Design

MyQ X implements **GDPR-compliant privacy by design principles**:

Limited Data Collection: The system collects only essential metadata required for operational functionality, avoiding unnecessary personal data processing that could increase privacy risks.

Automatic Deletion: Administrators can configure automatic deletion periods for print and scan job files, ensuring data is retained only as long as necessary for business purposes.

User Data Rights: Complete implementation of GDPR user rights including data access, anonymization, and the right to be forgotten, with customizable privacy notices on user interfaces.

Session Management: Automatic logout functionality ensures user sessions are properly terminated, preventing unauthorized access through abandoned sessions.

This comprehensive data protection and encryption framework ensures MyQ X maintains the highest standards of data confidentiality and integrity while supporting regulatory compliance requirements across diverse organizational environments.

12 Secure Printing Workflows

MyQ X provides comprehensive secure printing workflows that maintain full user control over document release while preventing sensitive information from being exposed in printer output trays. These workflows are essential for organizations requiring strict document security and user accountability.

12.1 Secure Print Release Implementation

Hold Print ensures print jobs are never released immediately to the printer. Documents are stored securely on the MyQ Server and printed only after the authorized user authenticates at the printing device, preventing unattended documents from being left in output trays.

Pull Print extends this further by allowing users to release their jobs on any capable device within the print system, not just the device to which they originally sent the job. This flexibility is particularly valuable during equipment maintenance or when users need to print from different locations.

Multiple Authentication Methods support Secure Print Release including PIN codes, ID cards, passwords, QR codes with biometric verification, and two-factor authentication combinations. This flexibility accommodates diverse organizational security requirements.

12.2 Pull Printing Workflows

Pull Print offers significant benefits for both administrators and end users:

Administrative Benefits:

- Eliminate stacks of unattended documents on office printers
- Enforce responsible printing behavior and document security policies
- Manage all printing through a single unified print queue
- Reduce printing waste and associated costs through preview and adjustment options
- Support flexible printing across multiple devices

User Benefits:

- Confidential documents remain secure until explicitly released
- Print to any authorized device in the organization
- Preview documents on the embedded terminal before release
- Modify print options (color, duplex, finishing) even after job submission
- Change print destinations at the device if original printer is unavailable

12.3 Print Job Timeout and Automatic Deletion

MyQ X implements automatic cleanup procedures to prevent prolonged document exposure:

Configurable Retention Periods: Administrators define how long print job files are stored on the MyQ Server before automatic deletion, balancing operational requirements with security needs.

Job Timeout Management: Jobs not released within specified timeframes are automatically removed from the hold queue, preventing forgotten or abandoned documents from accumulating on servers.

Automatic Logout: Device sessions automatically timeout after administrator-defined periods, preventing unauthorized document access on abandoned terminals.

12.4 Watermarking and Digital Signatures

Watermarking enables document traceability by adding customizable overlays to printed pages that can include:

- Confidentiality designations
- Print dates and timestamps
- Name of the person printing the document
- Printer identification information

These watermarks can be applied to every page or selected pages, creating an audit trail that helps identify leaked documents and trace them to their source.

12.5 Job Preview and Content Validation

The **Job Preview** engine enables administrators to review print jobs before release:

Format Support: Preview functionality supports the three most common page description languages - PCL 5, PCL 6, and PostScript.

Preventive Control: Administrators can reject unauthorized print jobs before they reach the printing device, preventing policy violations and protecting sensitive information.

Content-Based Filtering: Integration with OCR and Document Management Systems allows scanning policies to be enforced based on document content analysis.

12.6 Error Handling and Secure Job Recovery

MyQ X implements robust error handling to maintain security during device malfunctions:

Device Error Protection: When a printing device enters an error state (paper jam, out of toner), documents are held rather than automatically printing when the error is resolved, maintaining user control over release timing.

Session Preservation: If a device becomes unavailable mid-session, the MyQ system preserves the user session and allows continuation on alternative devices without losing document state.

Automatic Device Logout: When device errors occur, automatic logout clears the device's memory to prevent unauthorized document access by maintenance personnel or other users.

This comprehensive secure printing workflow architecture ensures organizations maintain strict control over document security throughout the entire print lifecycle while supporting operational flexibility and user productivity.

13 Device and Network Security

MyQ X provides comprehensive device and network security controls to protect multifunction devices (MFDs), printers, and network infrastructure from unauthorized access and exploitation.

13.1 Multi-Function Device Security Hardening

Organizations deploying MyQ X with MFDs should implement security best practices including:

Device Access Controls: Restrict physical access to printers to authorized locations and personnel only, reducing exposure to tampering or theft.

Unused Protocol Disabling: Turn off unnecessary device protocols and services that are not required by MyQ X, reducing the attack surface of each device.

Default Credential Management: Change all default administrator passwords on devices to strong, randomly generated credentials. Factory defaults are commonly known to attackers.

Internal Hard Drive Protection: If devices support internal storage of print jobs for reprinting, implement encryption (AES) and automatic data overwrite features to prevent unauthorized access to stored documents.

13.2 Network Segmentation and VLAN Configuration

MyQ X supports network segmentation strategies to contain potential device compromises:

VLAN Isolation: Separate printer and device network traffic from general user and administrative networks using virtual LANs, limiting lateral movement if a device becomes compromised.

Subnetting and Access Control Lists: Implement network-level access controls using Access Control Lists (ACLs) to ensure only authorized systems can communicate with print devices and servers.

Firewall Rules: Block unnecessary inbound and outbound traffic from printer subnets, limiting connectivity to only essential services and preventing infected devices from accessing other network resources.

FQDN Enforcement: All network communications must use fully qualified domain names (FQDN) rather than IP addresses or short hostnames, preventing DNS-based man-in-the-middle attacks and ensuring proper certificate validation.

13.3 SNMP v3 Security Implementation

MyQ X enforces modern **SNMPv3** protocols with strong encryption for device management:

Insecure SNMPv1 Prohibition: Legacy SNMPv1 communication must be disabled entirely, as it transmits credentials in clear text and lacks encryption.

SNMPv3 Configuration: All SNMP communication must use SNMPv3 with:

- Strong, randomly generated passwords for authentication
- SHA1 or stronger hashing algorithms
- AES encryption for data confidentiality
- Per-device, unique credentials specific to each MyQ deployment

13.4 Printer Credential Management

MyQ X recognizes that **printer credential management is vendor-specific** and requires customer-side implementation:

Strong Password Requirements: All printer administrative credentials must use strong, randomly generated passwords rather than default or simple credentials.

Credential Rotation: Periodically update printer passwords according to organizational security policies to reduce the risk of compromised credentials.

Access Restrictions: Limit printer management access to authorized personnel only through firewall rules, physical access controls, and role-based permissions.

13.5 Firmware Security and Update Management

Maintaining current device firmware is critical for security:

Automatic Updates: Configure devices to automatically receive and apply manufacturer firmware updates that address newly discovered security vulnerabilities.

Vendor Security Advisories: Monitor manufacturer security notifications for critical vulnerabilities affecting deployed devices and apply patches promptly.

Update Testing: Test firmware updates in non-production environments before deploying to production printers to ensure compatibility and functionality.

13.6 USB Port Management and Restrictions

MyQ X supports administrative controls for device USB connectivity:

USB Port Disabling: Administrators should disable inbound USB ports on MFDs to prevent:

- Direct printing over USB, bypassing MyQ security controls
- Direct access to device hard drives and stored data
- Unauthorized use of device functionality

Secure Direct Print Alternatives: Enable only approved secure printing methods (IPP/S, AirPrint with MyQ integration) while blocking insecure direct USB access.

This comprehensive device and network security framework ensures that print devices remain secure components of the MyQ X infrastructure while maintaining operational efficiency and organizational security posture.

14 Audit and Monitoring

MyQ X provides comprehensive audit and monitoring capabilities that enable administrators to maintain visibility over print operations, detect security incidents, and ensure compliance with organizational policies and regulations.

14.1 Real-Time Monitoring and Alerting

MyQ X monitors all print infrastructure components in real-time through multiple monitoring channels:

Device Status Monitoring: Continuous monitoring of printer and multifunction device status including toner levels, paper availability, error conditions, and device connectivity. Administrators receive immediate insight into device health and operational status.

Alert Management: Automated alerts notify administrators of critical events including device errors, low supplies, connectivity issues, and other operational problems. Alert notifications can be sent via email or integrated with Windows Event Viewer.

Event Notifications: Customizable event-based notifications trigger actions in response to specific device or system conditions, enabling proactive problem solving before issues impact operations.

14.2 Print Activity Logging and Analysis

MyQ X maintains **detailed audit trails of all print, copy, scan, and fax activities**:

Job-Based Accounting: Advanced accounting tracks each job independently, allowing detailed attribution to specific users, devices, projects, and cost centers. Jobs performed during a single user session are separately accounted for, providing precise usage data.

Activity Metadata: Comprehensive logging captures date of job submission, date of job release, device identification, paper format, simplex/duplex settings, color settings, and all other relevant job parameters.

MyQ Log: Real-time system log displays all server activity including system events, errors, warnings, authentication attempts, configuration changes, and administrative actions. Log messages are categorized by severity (Critical, Error, Warning, Info, Notice, Debug, Trace) and filterable by time period and subsystem.

14.3 User Behavior Analytics

MyQ X provides sophisticated analytics capabilities to understand printing patterns and detect anomalies:

Custom Report Generation: Advanced reporting capabilities allow administrators to create custom reports based on any combination of tracked parameters, enabling analysis of printing behavior by user, department, project, device, or time period.

Cost Center Tracking: Detailed attribution of print jobs to cost centers, projects, and user groups enables transparent expense reporting and supports informed decisions regarding printing policies.

Behavior Monitoring: Administrators can analyze printing patterns to identify unusual activity, excessive usage, or policy violations that warrant further investigation.

14.4 Incident Detection and Response

MyQ X supports security-focused monitoring through structured logging and alerting:

Failed Authentication Logging: Enhanced logging of authentication attempts, particularly failed login attempts, enables administrators to detect and respond to potential security threats. Since version 10.2, login attempt records are improved for easier filtering in the MyQ Log.

Log Notifier Rules: Customizable rules trigger automated notifications based on specific event types, subsystems, and message patterns, enabling rapid detection of security-relevant events. Rules can use regular expressions to search for specific patterns in log messages.

Critical Event Alerts: System automatically alerts administrators to critical events including security breaches, authentication failures, unauthorized access attempts, and configuration changes.

14.5 Log Retention and Archival Policies

MyQ X implements flexible log management to balance operational needs with compliance requirements:

Configurable Retention Periods: Administrators define the number of days before logs are automatically deleted, aligning retention with organizational data governance policies and regulatory requirements.

Log Export and Archival: Logs can be exported in Excel or CSV format for external storage and analysis. Scheduled exports enable automated log archival at regular intervals.

Long-Term Preservation: Exported logs can be stored in secure, encrypted repositories to maintain historical records for audit purposes, compliance verification, and incident investigation.

14.6 Advanced Filtering and Search Capabilities

MyQ X provides sophisticated tools for log analysis and investigation:

Saved Searches: Administrators can create, save, and share commonly used search filters for quick access to relevant log data. Saved searches can be organized into folders for easy management.

Time Period Filtering: Filter logs by specific date ranges or predefined periods to focus analysis on relevant timeframes.

Subsystem and Context Filtering: Search by specific MyQ subsystems (Web UI, Terminal, SMTP Server, etc.) and contexts (direct printing, specific devices) to isolate relevant events.

Verbosity Control: Select which log severity levels (Critical, Error, Warning, Info, etc.) are displayed, reducing noise and focusing on significant events.

14.7 Audit Log for Administrative Actions

MyQ X tracks all administrative changes through a dedicated **Audit Log**:

Configuration Changes: Records all modifications to MyQ settings, including who made the change, when it was made, and which system component was affected.

User Rights Management: Detailed tracking of changes to user permissions, group memberships, and access controls, with the ability to view detailed information about each change.

PIN and Credential Management: Enhanced tracking of PIN additions, removals, and modifications to monitor credential lifecycle.

Export Capabilities: Audit logs can be exported on-demand or scheduled for regular automated export, supporting compliance reporting and record retention requirements.

This comprehensive audit and monitoring framework ensures MyQ X provides administrators with the visibility needed to maintain security, detect threats, ensure policy compliance, and troubleshoot operational issues effectively.

15 Incident Response and Recovery

MyQ X provides comprehensive incident response and recovery capabilities designed to maintain business continuity during both planned and unplanned disruptions. The platform combines automated backup procedures, high-availability features, and flexible failover mechanisms to ensure print services remain operational even during system outages.

15.1 Security Incident Response Procedures

MyQ X supports structured incident response through multiple monitoring and alerting mechanisms:

Real-Time Incident Detection: Automated monitoring continuously tracks system health, authentication failures, configuration changes, and security events, enabling rapid detection of potential security incidents.

Alert Escalation: Configurable Log Notifier rules trigger immediate notifications to administrators when critical security events occur, including failed authentication attempts, unauthorized access attempts, and system anomalies.

Audit Trail Preservation: Comprehensive logging of all system activities ensures complete forensic data is available for incident investigation. The MyQ Audit Log tracks all administrative actions, configuration changes, and user activities.

Containment Procedures: In the event of a security incident, administrators can quickly isolate affected components, disable compromised accounts, and implement emergency access controls.

15.2 Recovery and Restoration Procedures

MyQ X implements robust backup and restoration capabilities to ensure rapid recovery from system failures or data loss:

Automated Database Backup: Regular automated backups of the MyQ database capture all configuration data, user information, and system settings. Backups are protected with password encryption and stored securely.

Full System Restoration: The restoration process recovers the complete MyQ environment including the database, certificates, configuration files, and reports. Administrators simply select the backup file and provide the password if protected.

Cluster-Aware Backup and Restore: For high-availability deployments using Microsoft Failover Clustering, MyQ supports backup to shared cluster storage and coordinated restoration across all cluster nodes.

15.3 High Availability and Failover

MyQ X provides multiple failover strategies to maintain printing operations during server downtime:

Microsoft Failover Clustering Integration: MyQ X deploys in active-passive configurations within Microsoft Windows Server Failover Clusters. The cluster software continuously monitors node health and automatically switches to passive nodes when the active node becomes unavailable.

Fallback Printing: When the MyQ Desktop Client detects lost connection to the server, it automatically redirects print jobs to pre-configured fallback printers. Once server connectivity is restored, job accounting is automatically updated.

Device Spooling: Print jobs can be stored encrypted in device memory during server outages. When connectivity is restored, devices automatically transmit accounting data to the server.

Offline Login: MyQ X embedded terminals cache user authentication credentials, allowing users to log in and access device functionality even when the server is unavailable.

Client Spooling: Jobs are processed locally on user workstations and stored on their computers rather than the server, significantly reducing bandwidth requirements and enabling printing during server maintenance or network issues.

15.4 Post-Incident Analysis and Improvement

MyQ X supports continuous improvement of incident response capabilities through comprehensive analysis tools:

Historical Log Analysis: Administrators can review exported logs to understand the sequence of events leading to an incident, identify root causes, and determine appropriate corrective actions.

Audit Trail Review: The Audit Log provides complete visibility into all administrative actions and configuration changes that may have contributed to or preceded security incidents.

Saved Search Patterns: Administrators can create and save search filters within logs for common incident patterns, enabling rapid identification of similar events in the future.

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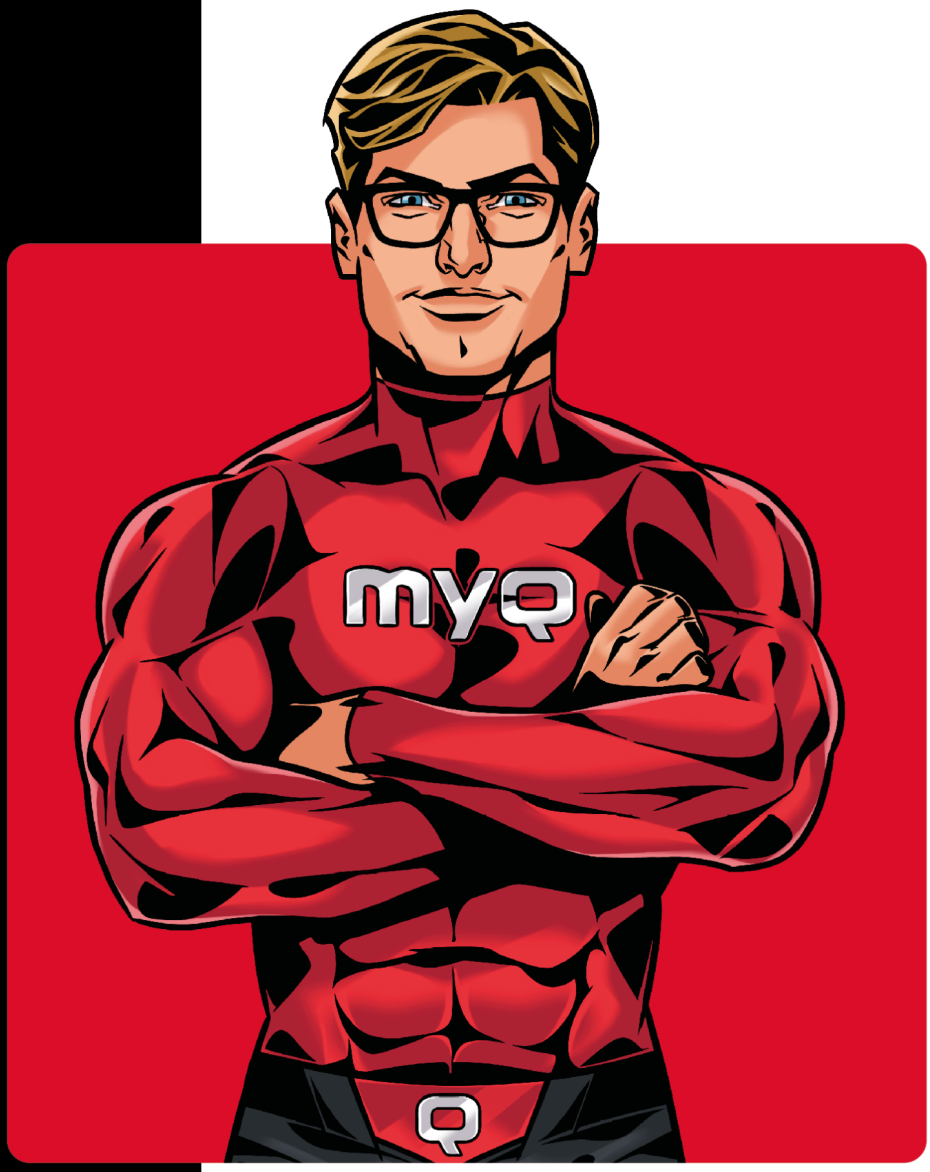

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