Midaxo

Midaxo+ Security Whitepaper

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Executive Summary

Midaxo is committed to maintaining a high level of information security, and its key priority is always protecting customers' information and carefully maintaining the information security of Midaxo Platforms. This Security White Paper gives an overview of the Midaxo+ Platform security features. Midaxo+ Platform is the second-generation software architecture that Midaxo's products released after January 2021 are based on. This includes Pipeline+ and Deal+ products.

The certified Midaxo information security management system (Midaxo ISMS) complies with the international ISO/IEC 27001:2013 standard. The design of security controls is based on risk analysis. Risk management is periodically performed throughout the organization to ensure the mitigation of any emerging security risks. Midaxo ISMS defines the security processes, roles, and responsibilities for implementing information security management as an integral part of Midaxo's business and operations. Midaxo ISMS, together with Midaxo's information security policy, are periodically reviewed to ensure they are up to date.

Midaxo+ Platform is developed, operated, and maintained by motivated, competent personnel that are committed to maintaining a high level of information security. Continuous security education and training supports them to maintain security awareness in the organization. The technical implementation of Midaxo+ Platform has been designed to meet customers' strict security requirements and industry best practices.

Technical security starts with comprehensive security architecture that defines a solid and secure foundation for Midaxo+ Platform. The architecture is based on well-proven and widely used secure services, methods, and protocols, and it has been defined to protect data both in transit and at rest and to ensure its confidentiality, integrity, and availability. Strict access control allows only authorized users to access the data.

Operation and maintenance of the Midaxo+ Platform follows documented processes and plans. Continuous monitoring of information security and system performance ensures that all deviations and incidents can be responded to in a timely manner by trained and competent personnel in accordance with the incident response process.

Because of today's ever-changing risks and security threats, Midaxo's security team closely monitors security updates, alerts, and advisories from applicable system and software vendors as well as various security organizations and authorities. Based on risk analysis, the security team deploys applicable mitigation methods and security controls. Periodic security audits and

technical tests performed by independent third-party information security companies ensure that information security fulfils all requirements and meets the highest standards.

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Introduction to Midaxo+ Platform

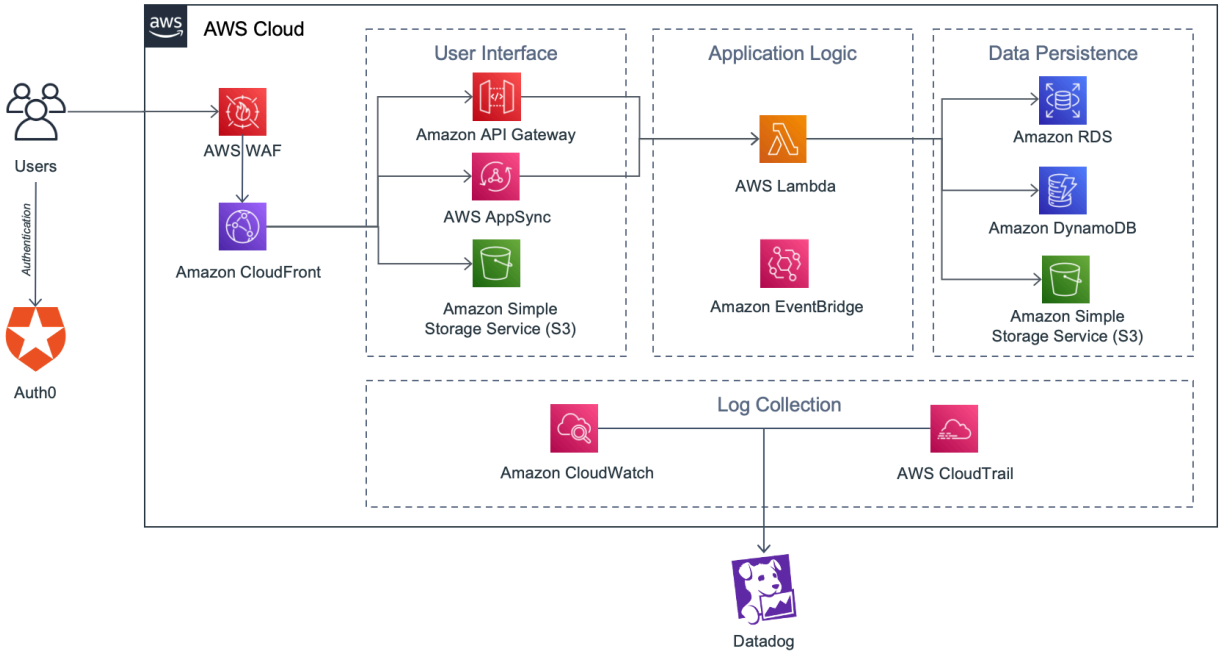
Midaxo+ Platform helps Corporate Development teams to perform mergers and acquisitions (M&A), divestments, various rationalization processes, various partnership models in a defined a systematic way.

Midaxo+ provides an enterprise-wide pipeline of deals in different stages. Each deal has its own workspace where all deal-specific information can be stored.

The Midaxo+ Platform is designed for managing confidential information such as information under stock market insider trading legislation. Therefore, it has multi-level access rights management capabilities, and, by default, users cannot view any deals. Administrative users can grant access to individual deals. In addition, within deals, administrative users have granular permissions management options to grant users access only to individual tasks and documents.

Midaxo+ Platform Architecture

Midaxo+ Platform runs on Amazon Web Services' (AWS) leading cloud platform, utilizing the AWS Serverless Computing. With serverless computing, infrastructure management tasks like capacity provisioning and patching are handled by AWS.



Midaxo+ Platform environment contains several distinct layers of services

1. User Interface layer

   Provides the user interface through a Single Page Application (SPA) hosted from Amazon Simple Storage Service (S3).

2. Authentication layer

   Provides authentication for all users through Auth0 identity provider by granting OpenID Connect (OIDC) based identity and access tokens.

3. Application Programming Interface (API) layer

   Provides the business logic interface for the User Interface layer and is responsible for storing the data to the Data Persistence layer.

4. Data Persistence layer

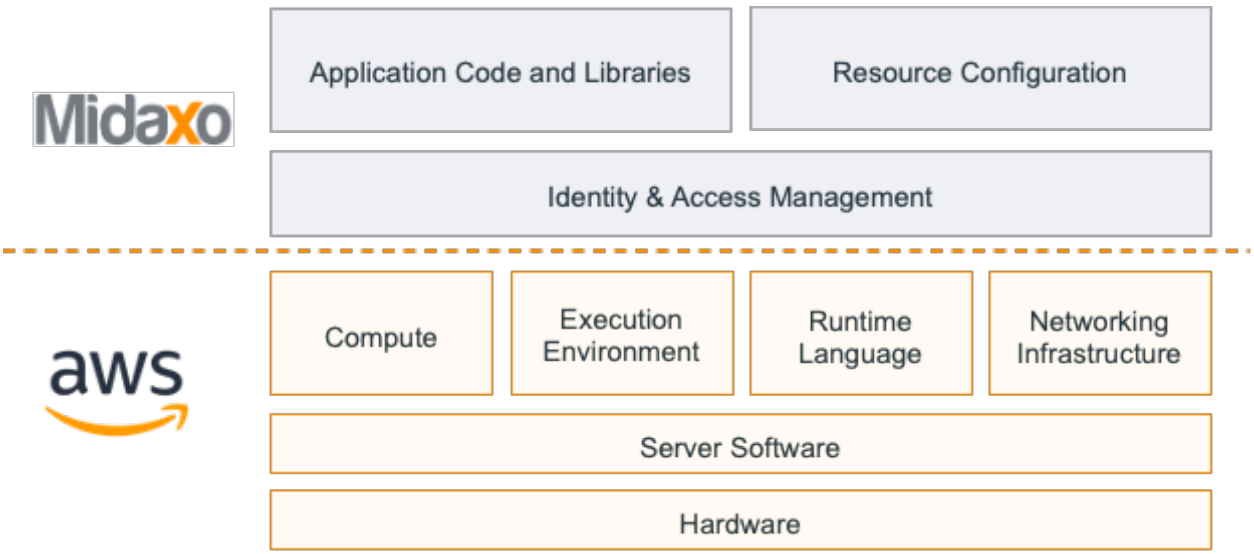
   Provides the data storage for the Application Interface layer.

5. Event & Log Handling layer

   Provides event handling on user and system activities, triggered by the API and Data Persistence layers.

Shared Responsibility model

In serverless computing, Security and Compliance is shared responsibility between AWS and Midaxo. Midaxo is responsible for the security of the actual Application Code and Libraries, AWS Resource Configuration, and for Identity and Access Management.



More information: https://docs.aws.amazon.com/whitepapers/latest/security-overview-aws-lambda/the-shared-responsibility-model.html

Software

Midaxo+ Platform is built on top of AWS managed services and is fully Serverless (Midaxo is not managing any virtual machines or physical servers).

User Interface layer hosts a React based Single Page Application (SPA) that embeds other SPAs in the main Single Page Application. This application is hosted on Amazon S3 as a static site and has an Amazon CloudFront content distribution network (CDN) provisioned in front of it.

Authentication layer is fully managed by Auth0 and is integrated to the User Interface layer through Auth0's SDKs and the API layer is configured to trust only tokens issued from the Midaxo+ Platform's Auth0 tenant.

API layer has several AWS AppSync GraphQL endpoints provisioned that use AWS Lambda based functions to read and write from the Data Persistence layer. AWS Lambda functions are implemented in Python programming language. API layer publishes events to Amazon EventBridge for communication across the different services within the API layer.

Data Persistence layer stores the data in Amazon DynamoDB NoSQL database and uploaded files are stored in Amazon S3.

Log Handling layer uses Amazon CloudTrail and Amazon CloudWatch Logs to ship the logs for processing to Datadog. Datadog provides a centralized logging service for Midaxo+ Platform.

Network Security

As described in the shared responsibility model, Midaxo+ Platforms Networking Infrastructure is responsibility of AWS. Midaxo is responsible for configuring the access to different services utilizing AWS tools.

Midaxo+ Platform is accessible via a browser, and all communication goes through AWS Web Application Firewall. All communication with client computers is encrypted with 256-bit SHA TLS certificates with 2048-bit key provisioned by Amazon Certificate Manager (ACM).

All AWS Services, including Web Application Firewall is monitored 24/7 basis with Datadog security monitoring. For more information about monitoring, see the Monitoring and Logging section of this White Paper.

To ensure network security, the Midaxo office network that is used for administrative work is segregated from the Midaxo+ Platform production environment.

Separate quality assurance and staging environments are used for testing. These environments are separated from the production environment.

Midaxo+ Platform Security

The software architecture follows AWS' and Auth0's best practices for secure multi-tenant application design. Midaxo+ Platform is developed by following secure software development practices, and a third-party security testing is performed for the new features.

Midaxo uses only well-known services or third-party libraries for product development and for delivering Midaxo+ Platform. Midaxo maintains a list of all third-party components in use and regularly follows published vulnerabilities and software updates related to the third-party components.

Midaxo+ Platform administrators use two-factor authentication and personal admin accounts when operating the Platform. Accounts are reviewed regularly, and passwords must meet length, complexity, and renewal requirements as defined in the Midaxo password policy. In addition, Midaxo administrator accounts are prohibited from using the most recent passwords.

Amazon Web Services platform security is proven by the following certifications and audits:

- SOC 1/ISAE 3402
- SOC 2
- SOC 3
- Cloud Security Alliance (CSA) STAR registrant, and has completed the CSA Consensus Assessments Initiative Questionnaire (CAIQ)
- PCI DSS Level 1 compliance
- ISO 27001 Information Security Management – certification
- ISO 9001 Quality Management – certification

For more information about Amazon cloud platform security, visit the AWS Security Center.

Midaxo+ Platform Application Security

Authentication

To access Midaxo+ Platform, users are authenticated either with username and password, or with Single Sign-On using organizations identity provider. Supported SSO protocols are SAML 2.0 and Open ID Connect (OIDC). Authenticated users get a security token to identify them. The

token exchange uses the Authorization Flow with PKCE that secures the security token retrieval. In each request to the Midaxo Application server, the security token is checked. Based on the security token, a user can be authorized.

Midaxo+ Platform uses Auth0 for authentication and authorization. Auth0 locks a user account after a defined number of failed login attempts. If a session is idle for a defined period, it will expire automatically and require the user to log in again.

Access Control

Customers are logically isolated in Midaxo+ Platform. For a single customer, there can be multiple processes, deals, tasks, and documents, each separated using role-based access control.

Midaxo+ Platform has requirements for end-user password length and complexity. Passwords are hashed and then stored in the Auth0 database. Hashing is implemented with the bcrypt algorithm and uses 10 salted rounds.

Each customer is granted one company admin account. The account admin is responsible for creating user accounts for an organization via self-service as well as with support. Midaxo does not manage customer account credentials. The customer is responsible for cancelling an admin account.

Customer Data Security

Customers can choose to store their data exclusively in one of the Midaxo+ Platform instances. Midaxo currently operates one instance in EU and one in US. Customer data stored in the Midaxo EU instance are physically located in the AWS Ireland Region (Dublin). Customer data stored in Midaxo US instance is physically located in the AWS Ohio region. All data stored in every Midaxo+ Platform instance is considered confidential.

Customers have ownership of their data. Midaxo policy restricts Midaxo personnel, including admin's access to customer data to support purposes only when requested by the customer. The principle is that support is primarily conducted without accessing or seeing the customer's

data and, secondarily, if necessary, by arranging a screen-sharing session or the customer granting temporary access rights to a project and data.

Customer account and all other customer data associated with the account are deleted automatically from Midaxo+ Platform within 60 days of account termination or expiration. Data are still stored in daily backups, off-site backups, and snapshots for a year. After one year, the customer data are deleted completely in accordance with AWS' policy.

Data Security in Transit and at Rest

All end-to-end data transmissions are encrypted with 256-bit AES TLS. Transmissions between the client computer and the application use the HTTPS protocol with TLS. Data stored in the Data Persistence layer is encrypted at rest and Amazon Key Management Service (KMS) is used for key management. Keys are rotated annually.

Each customer's data are stored in databases that are logically isolated from other customers. Each row in the database is identified with customer's globally unique identifier as shown in the figure 4.

Guid	Customer Guid	…
3f9abd14-b94e-434a-a532-b22a161eb51c	7961f694-b0cb-4c51-97d9-0113b406ae0f	…
c99f5179-8dd7-4965-8a78-3eb56401c38c	7961f694-b0cb-4c51-97d9-0113b406ae0f	…
029d82fd-414f-43b8-93ba-4758b7574455	426fc032-9957-45da-a711-791cc4e11909	…

Figure 4 Customer Data Separation in Midaxo+ Platform

Same isolation by customer's globally unique identifier is used within the document storage.

The use of access control list-based, item-level permissions provides a secondary safeguard against possible failures in data isolation between customer accounts. All stored deals, tasks, documents, etc. have item-level permissions, in addition to customer data isolation, to ensure that only authorized users can access them.

The possibility of circumventing access rights or isolation between customer accounts are analysed and tested in each development iteration by Midaxo's own development team, and periodically by an independent external auditor.

Data breach notification practices

In case of a data breach or any other critical security incident, Midaxo always notifies the affected customers immediately upon discovery and informs them of the scope and mitigation activities. To date, Midaxo has never experienced any data breach incidents.

Data Release

Midaxo guarantees that customer data or log files are only released if demanded by a court order. Midaxo always notifies the customer prior to any release taking place.

Monitoring and Logging

Midaxo's monitoring team is always on standby for alarms generated by various automatic monitoring systems.

Midaxo+ Platform's availability is monitored by an automated service with heartbeat functionality, ensuring that both front-end and back-end services are available and responding correctly. As Midaxo+ runs on AWS serverless technologies, AWS ensures the availability of computing resources.

The platform security is monitored in real time for threats and misconfigurations. Alarms generated by the SIEM solution are analyzed and escalated in a timely manner to Midaxo's incident management process to ensure proper incident response.

Login attempts to Midaxo+ Platform are monitored to detect malicious attacks such as brute-force attacks on a customer's account. The number of allowed incorrect credential combinations is restricted, and abnormal activity is reported to the affected customer.

Midaxo+ Platform application usage and access management events are logged, which allows Midaxo support to manually investigate potential cases of misuse reported by customers.

Midaxo's access to the application log files is limited to named personnel, and Midaxo's policy only allows access for support purposes.

Furthermore, Midaxo+ Platform system logs are monitored to detect any abnormal activity.

Midaxo+ Platform Availability and Continuity

Backups and Redundancy

Midaxo+ Platform data is automatically backed up daily. All backups are encrypted with Amazon KMS. The daily backups are stored for 90 days, and monthly backups are kept for one year.

All customer data can be fully recovered in case of hardware failure or an outage of the Amazon service. Midaxo+ Platform runs on multiple Amazon availability zones and outages in a single availability zone do not affect the service availability.

Continuity and Disaster Recovery

Midaxo's business continuity plan covers various scenarios with prevention, response, and recovery strategies. The continuity plan is regularly updated based on a risk analysis, and Midaxo's monitoring team regularly tests the plans and work instructions.

Information about Midaxo+ Platform outages will be published on the Midaxo website at https://support.midaxo.com and by email. Affected customers will be notified immediately upon discovery.

For details on Amazon Web service availability and disaster recovery, visit the following Web pages: http://aws.amazon.com/architecture/ and http://aws.amazon.com/backup-recovery/.

Physical Security

AWS Data Centers

AWS deploys comprehensive physical security measures to protect its data centers. To maintain certifications such as ISO/IEC 27001 Information Security Management, AWS is required to set up and maintain physical security controls such as video surveillance, physical access management, visitor access rules, and protection against exterior threats such as burglary or fire.

For more information about the physical security of AWS data centers, visit the AWS Security Center.

Midaxo Offices

Midaxo's offices are protected with the following physical security controls:

- **Physical access:** Physical access to Midaxo's offices is granted to authorized personnel only. Access rights are reviewed regularly.
- **Badges:** Midaxo personnel are required to wear badges at the Midaxo offices at all times. Badges are regularly renewed.
- **Visitor access:** Visitor access rules restrict visitor access to limited areas. All visitors are registered and escorted by Midaxo personnel.
- **Protection against external threats:** Midaxo's offices are protected with 24/7 video surveillance as well as intrusion and fire alarm systems.

Midaxo+ Platform production data and customer data are not stored on Midaxo office premises.

Primary copies of software source code and other operation-critical data are stored off-site to ensure disaster recovery capabilities in crisis situations.

Midaxo's Information Security Management System

The information security management system has strategic importance to Midaxo, as Midaxo recognizes the importance of information security and confidentiality in the field of Corporate Development and M&A. Midaxo's information security management system is an integrated part of Midaxo's day-to-day operations and governance covering Midaxo's personnel, processes, and systems.

Policies for Information Security

Midaxo has internal information security policies defining Midaxo's security requirements and controls. Employee awareness is ensured through new employee induction and regular training thereafter. The policies are reviewed at least annually and approved by Midaxo's management team.

Roles and Responsibilities in Information Security

Midaxo's management team sets targets for information security and regularly reviews their current status. The management team acts as an information security steering group. Midaxo's CISO is responsible for information security management.

Processes

Midaxo has defined a set of processes to ensure information security in all its operations as well as in Midaxo+ Platform.

Software Development, Testing, and Release

Midaxo utilizes Agile processes in software development, allowing the management of software releases from the development phase to release as an ongoing cycle of software development, testing, and release.

Midaxo has defined policies and procedures for software development, testing, and release management. Development and testing are performed in an environment that is separated from

the Midaxo+ Platform production environment. Midaxo uses a Microsoft Visual Studio Code development environment and similar tooling, and Git for source code management.

Information security is integrated into the requirement definition, testing, and code review phases. In the requirement definition phase, information security is always considered based on a risk analysis. Vulnerabilities are tested during the software testing phase with test automation. Midaxo holds a code review meeting as part of development sprints. Midaxo uses peer review and automated tools for static code analysis. Additionally, Midaxo+ Platform is continuously scanned for vulnerabilities using Dynamic Application Security Testing (DAST), Static Application Security Testing (SAST) and Software Composition Analysis (SCA) tools. In addition to internal testing, Midaxo uses independent security expertise services companies regularly to perform penetration testing on the application.

Decision-making points are set to determine software versioning and the version to be released. Only a strictly limited number of development personnel have access to the software code repository or are authorized to make release decisions.

Vulnerability Management

Regarding vulnerability management, Midaxo maintains a list of all third-party components used in Midaxo+ Platform and regularly follows published vulnerabilities and software updates related to the third-party components.

In addition, Midaxo closely monitors security updates, alerts, and advisories from various security organizations and authorities to monitor security threats and possible vulnerabilities. Based on risk analysis results, Midaxo deploys applicable mitigation methods and security controls when required.

Change Management

All changes to Midaxo+ Platform and software are processed in accordance with the Midaxo change management process. The change management process ensures that all changes are properly planned, approved, and documented, and that associated risks are analyzed, and changes are implemented in a controlled manner.

Incident Management

Midaxo's customers can report incidents through the feedback function or by contacting customer support. Midaxo's policy holds each employee responsible for reporting perceived security incidents. Midaxo also receives alarms via various automatic channels. These are discussed in greater detail in the Monitoring and Logging section of this White Paper. Each alarm will be escalated as quickly as possible. Each incident will be analyzed to determine whether changes in the existing architecture or implementation are necessary. All reported incidents are logged, and the remedial action indicated. Critical security incidents and data breaches are always promptly reported to the affected customers upon discovery.

Access Control

Employee access to resources is limited to a role-based need to know basis. Access rights are granted, regularly reviewed, and deleted following the documented processes. Passwords must follow length, complexity, and renewal requirements as defined in Midaxo's password policy.

Access to the software code repository and the Midaxo+ Platform production environment is restricted to a few software developer roles. The production environment requires two-factor authentication.

Other Processes

1. Risk management

   Internal and external risk analysis is performed regularly. Identified risks are managed with prevention, mitigation, response, and recovery strategies. Policies and processes are continuously improved based on the risk analysis findings.

2. Human resources

   Human resources ensure information security within processes for new personnel recruitment, during employment, and on termination of employment. For example, during recruitment, candidates are interviewed and background-checked, each new employee's induction includes Midaxo information security training, and information security awareness is maintained by regular training during employment.

3. Asset management

Midaxo manages an inventory of assets, and the acceptable use of assets is defined in the respective policies governing teleworking and mobile usage. Midaxo uses an information classification scheme to ensure that information is appropriately protected. Classified information is labeled and handled according to each classification. When assets, both electronic and paper, are no longer needed, disposal is handled securely according to formal procedures.

4. Supplier management

   Midaxo chooses suppliers carefully following a defined set of criteria. Supplier access to information is limited on a need to know basis, depending on the supplier's role and assigned responsibilities. Non-disclosure agreements are signed with suppliers.

5. Key management

   Midaxo's policy defines an information classification scheme and the acceptable use of classified information. The policy defines the use of cryptographic controls. For example, sensitive information is always transmitted in encrypted form. Cryptographic keys are stored in Amazon KMS securely outside the customer database instance.

Certifications & Audits

Midaxo has ISO/IEC 27001:2013 Information Security Management certification. ISO 27001 is an internationally recognized security management standard that specifies security management best practices and comprehensive security controls.

The Midaxo+ Platform service is regularly penetration tested by independent information security expert services companies. Customers and prospects can download the latest attestations and/or certificates from Midaxo website when the companies provide such as part of their service or request information directly from Midaxo. The independent penetration testing verifies that the Midaxo+ Platform architecture and software are designed, implemented, and maintained securely. Other independent third-party auditors and expert service companies regularly audit Midaxo+ Platform's security.

In addition, customers have audited Midaxo+ Platform. Midaxo offers customers the opportunity to perform security audits and penetration testing of their own with a test instance with the same architecture as in Midaxo+ Platform.

Personal Data

Midaxo's practices for collecting, processing, protecting, and disclosing personal data are detailed in Midaxo's Privacy Policy.

The following personal data are processed and stored in Midaxo+ Platform during the registration process:

1. First and last name
2. Company address
3. Work phone number
4. Work email address

All customer data are stored in the AWS cloud service and are encrypted at-rest and in-motion. Main location of the data is Germany (Frankfurt), and Oregon in US.

For additional information on compliance provided by Amazon Web Services, see http://aws.amazon.com/compliance.

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