



The MathWorks, Inc. Service Organization Control 3 Report



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SECTION 1

Independent Service Auditors' Report



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Independent Service Auditors' Report.

To: The Management of The MathWorks, Inc.

Scope:

We have examined MathWorks accompanying assertion titled Assertion of MathWorks Management (Assertion) that the controls within MathWorks Cloud-Based Applications System (System) as of August 21, 2020, to provide reasonable assurance that MathWorks principle service commitments and System requirements were achieved based on the trust services criteria relevant to security (applicable trust services criteria) set forth in *TSP 100, 2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy (AICPA, Trust Services Criteria)*.

MathWorks utilizes Amazon Web Services (AWS) (subservice organization) to cloud-hosting services. The Description of the Boundaries of the System (Section 3) indicates that MathWorks controls can provide reasonable assurance that certain service commitments and system requirements, based on the applicable trust services criteria, can be achieved only if AWS controls, assumed in the design of MathWorks controls, are suitably designed and operating effectively along with related controls at the service organization. The Description presents MathWorks System and types of controls that the service organization assumes have been implemented, suitably designed, and operating effectively at AWS. Our examination did not extend to the services provided by AWS and we did not evaluate whether the controls management assumes have been implemented at AWS have been implemented or whether such controls were suitably designed and operating effectively as of August 21, 2020.

Service Organization's Responsibilities

MathWorks is responsible for its service commitments and system requirements and for designing, implementing, and operating effective controls within the System to provide reasonable assurance that MathWorks service commitments and system requirements were achieved. MathWorks has also provided the accompanying assertion about effectiveness of controls within the system. When preparing its assertion, MathWorks is responsible for selecting, and identifying in its assertion, the applicable trust services criteria and for having reasonable basis for its assertion by performing an assessment of the effectiveness of the controls within the System.

Service Auditors' Responsibilities

Our responsibility is to express an opinion based on our examination, on whether management's assertion that controls within the System were effective throughout the period to provide reasonable assurance that the service organization's service commitments and system requirements were achieved based on the applicable trust services criteria. Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform our examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

An examination included:

- Obtaining an understanding of the System and the service organization's service commitments and system requirements;
- Assessing the risks that controls were not effective to achieve MathWorks service commitments and system requirements based on the applicable trust services criteria; and
- Performing procedures to obtain evidence about whether controls stated within the System were effective to achieve MathWorks service commitments and system requirements based on the applicable trust services criteria.

Our examination also included performing such other procedures as we considered necessary in the circumstances.

Inherent Limitations

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls.

Because of their nature, controls may not always operate effectively to provide reasonable assurance that the service organization's service commitments and system requirements are achieved based on the applicable trust services criteria. Also, the projection to the future of any conclusions about the effectiveness of controls is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Opinion

In our opinion, MathWorks management's assertion that the controls within MathWorks Cloud-Based Applications System were effective as of August 21, 2020 to provide reasonable assurance that MathWorks service commitments and system requirements were achieved based on the applicable trust services criteria is fairly stated, in all material respects, if the subservice organizations applied the controls assumed in the design of MathWorks controls as of August 21, 2020.

O'Connor + Drew, P.C.

Braintree, Massachusetts
September 11, 2020

SECTION 2

Assertion of MathWorks Management



Assertion of MathWorks Management

We are responsible for designing, implementing, operating, and maintaining effective controls within MathWorks Cloud-Based Applications System (System) as of August 21, 2020, to provide reasonable assurance that MathWorks service commitments and system requirements relevant to security were achieved. Our description of the boundaries of the System is presented below and identifies the aspects of the System covered by our assertion.

We have performed an evaluation of the effectiveness of the controls within the system as of August 21, 2020, to provide reasonable assurance that MathWorks service commitments and system requirements were achieved based on the trust services criteria relevant to security (applicable trust services criteria) set forth in *TSP 100, 2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*). MathWorks objectives for the System in applying the applicable trust services criteria are embodied in the service commitments and system requirements relevant to the applicable trust service criteria. The principle service commitments and system requirements related to the applicable trust service criteria are presented below, in Section 3.

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls. Because of these inherent limitations, a service organization must achieve reasonable, but not absolute, assurance that its service commitments and system requirements are achieved.

We assert that the controls within the System were affective as of August 21, 2020, to provide reasonable assurance that MathWorks service commitments and system requirements were achieved based on the applicable trust services criteria.

The Management of The MathWorks, Inc.

SECTION 3

MathWorks Description of the Boundaries of its Cloud-Based Applications System



Company Overview and Background

MathWorks (www.MathWorks.com) is a leading developer of software for technical computing and Model-Based Design. MathWorks develops, markets, and licenses its products to companies and users in over 100 countries on all seven continents. Its customers include 4,000,000 of the world's leading technical people, who work at the world's most innovative technology companies, research labs, financial institutions, and at more than 6,500 universities. MathWorks core products are MATLAB and Simulink. MATLAB is a programming environment for algorithm development, data analysis, visualization, and numeric computation. Simulink is a block diagram environment for simulation and Model-Based Design of multi-domain and embedded engineering systems. The company produces over 100 additional products for specialized tasks. MathWorks products are used throughout the automotive, aerospace, communications, electronics, and industrial automation industries as fundamental tools for research and development.

Overview of Products and Services

This section provides an overview of the products and services that are in scope of this system description.

MATLAB® Online™

MATLAB is a high-performance technical computing environment, which combines comprehensive math and graphics functions with a powerful high-level language. MATLAB Online is the online, browser-based version of the MATLAB software that provides access to the latest version of MATLAB from standard web browsers. Integration with MATLAB Drive enables users to store, access, and manage files with MATLAB Online.

MATLAB® Drive™

MATLAB Drive provides a common cloud-based storage location for MATLAB files that integrates with MATLAB Online. Users can sync MATLAB Drive files to their local computer by installing MATLAB Drive Connector, a separate desktop program.

MATLAB® Grader™ - LTI® Service

MATLAB Grader allows instructors to create and share MATLAB-based interactive course assignments for their students, including rich text, images, hyperlinks, and LaTeX equations in problem descriptions and a library of reusable example problems, by using a browser-based authoring environment. MATLAB Grader – LTI® Service is a feature in MATLAB Grader that provides automatic grading of students' MATLAB code, real-time feedback to students, access to the latest version of MATLAB and toolboxes for use in assessments, and integration within a learning environment and gradebook using Learning Tool Interoperability (LTI) standards. (Learning Tools Interoperability (LTI)® is an education technology standard developed by the IMS Global Learning Consortium.)

Online MATLAB Training

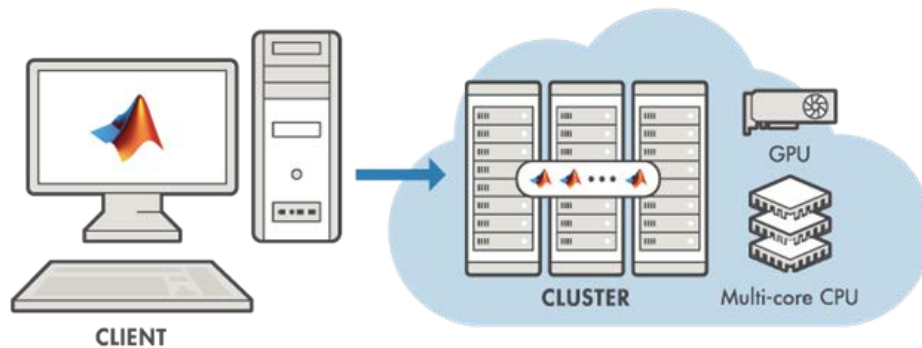
Online MATLAB Training provides free and paid online training courses about MathWorks products and their use in various applications. The course content is created by experts at MathWorks and is updated regularly to include the latest product features.

Courses can be accessed on-demand and consist of videos, reading materials, quizzes, and hands-on practice problems in which users interact with MATLAB in the context of the learning environment and receive automated

feedback on their submissions. Most of the courses are accessible from a standard web browser while others can be accessed from MATLAB installed on laptop or desktop computers. A completion certificate is provided upon the completion of a course.

Cloud Center

Cloud Center allows users to easily create and access compute clusters in the Amazon Web Services (AWS) cloud for parallel computing. Users can access a cloud cluster from their client MATLAB session like any other cluster in their own onsite network. Cloud Center enables users with a MathWorks account and Amazon Web Services account to create and access their own Amazon compute clusters with the specific hardware to meet their compute requirements.



Components of the System

Software

The applications in the system mentioned above are hosted on AWS cloud via a web server architecture. Application requests are routed to the web servers through Amazon AWS Route 53 DNS web service and Amazon AWS Load Balancers. User access is granted after successful authentication of a MathWorks account and verification of license for the user. Students and instructors access MATLAB Grader through their organization's Learning Management System. Outbound requests are routed back to the user through Amazon AWS CloudFront. Depending on the product, data is stored in Amazon RDS Database or Amazon DynamoDB.

Several applications are used to monitor system health and events across all services, such as:

Amazon GuardDuty	Monitors AWS accounts and workloads for malicious activity and unauthorized behavior
AWS CloudTrail	Supports governance, compliance, operational auditing, risk auditing and detecting unusual activity in AWS accounts

The company also uses other enterprise tools to monitor cloud security compliance, real-time event data, and its IT infrastructure.

Additional supporting software utilities to support the following activities are used by MathWorks to execute controls relevant to the in-scope applications but are not directly covered in this report:

- Work management for iterative software development
- Content collaboration and document management
- Source code management and version control
- Customer relationship management

The systems in scope are dependent on the following internal applications/services although they are not directly covered in this report:

Hosted license manager	Provides the ability to host MathWorks software licenses from a cloud-based license manager
Data store	Cloud-based file system hosted on AWS that constitutes the underlying storage technology behind MATLAB Drive
Infrastructure services	MathWorks proprietary compute technology that supports MATLAB Online, MATLAB Grader, and Online MATLAB Training
MathWorks Account Management	Centralized framework for cloud-based authentication of MathWorks accounts for external customers across in-scope applications

Infrastructure

Each application in the system uses one or more of the following infrastructure components. MathWorks uses Amazon Web Services (AWS) as its subservice organization for infrastructure as a service (IaaS) hosting of the system in scope. The descriptions of the services below are provided by Amazon.

Amazon AWS Route 53	Highly available and scalable cloud Domain Name System (DNS) web service which connects user requests to infrastructure running in AWS
Amazon Simple Storage Service (Amazon S3)	Object storage service that helps organize data and configure finely tuned access controls to meet specific business, organizational, and compliance requirements
Amazon Elastic Compute Cloud (EC2)	Web service that provides secure, resizable compute capacity in the cloud
Amazon AWS Elastic Load Balancer	For automatic distribution of incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, IP addresses, and Lambda functions
Amazon AWS CloudFormation	Provides a common language to model and provision AWS and third-party application resources in the cloud environment
Amazon AWS CloudFront	Content delivery network (CDN) service that securely delivers data, videos, applications, and APIs to customers globally with low latency and high transfer speeds

Amazon RDS	Relational Database Service that supports key product functionality
Amazon DynamoDB	Key-value and document database that delivers single-digit millisecond performance at any scale
Amazon Simple Email Service	Cloud-based email sending service

Additional services are used by MathWorks to support its storage and application infrastructure, email services, and product development.

People

The personnel supporting the system include, but are not limited to the following:

- **Senior Management:** Includes the President and CEO of the company and all Vice-Presidents. They are responsible for overseeing company-wide activities, establishing and accomplishing goals, and overseeing objectives for the company.
- **Development:** Responsible for developing, testing, and releasing applications into production. This includes creating and maintaining product documentation, managing internal tools, providing quality assurance services, supporting internal process improvement and training needs.
- **Legal Services:** Responsible for formulating policies that protect MathWorks intellectual property and support legal compliance.
- **Website and Database Operations Teams:** Responsible for day-to-day management of the system ensuring application availability and security for internal users and customers.
- **System Services:** Responsible for providing enterprise infrastructure, IT process and tools and collaboration services.
- **MathWorks Security:** Responsible for information and product security.
- **Human Resources:** Responsible for hiring, performance management and communicating company-wide policies.
- **IT Training:** Responsible for creating and delivering IT training material and facilitating organizational/process change management.
- **Physical Security:** Responsible for protecting company assets, including, but not limited to, staff, facilities, equipment, and intellectual property through the implementation and management of a wide variety of safety and security policies, procedures, and programs.

Procedures

Standard operating procedures are documented for policies that need to be enforced at the company-level, department-level, or team-level. Along with these procedures, management has identified and put in place standards that ensure the achievement of objectives in the procedures. Control activities are established to guide the implementation of procedures.

MathWorks has developed and communicated policies relating to the following areas to its internal users:

- Change Management
- Risk Management
- Human Resources
- Internal Quality Assurance

- Physical Access Management
- Logical Access Management
- Asset Management
- Incident Management
- Vendor Relationship
- Encryption

Policies relevant to external customers are also published on the www.mathworks.com site:

- Privacy Policy
- Vulnerability Disclosure Policy

In addition to the above procedures, manual and automated control activities are described in the sections "Control Environment" and "Control Activities and Relevant Aspects of Operations" below.

Data

User Login Data Collection and Management

The system requires users to sign in with their MathWorks account, except for MATLAB Grader and certain online training courses in Online MATLAB Training. Users are encouraged to use a strong password to protect against unauthorized access. Users can choose to enable two-step verification for their MathWorks account to help safeguard against unauthorized access.

Where MATLAB Grader is accessed in conjunction with an educational institution's learning management system, MathWorks receives only anonymized user IDs through MATLAB Grader that MathWorks cannot associate to any individual. When MATLAB Grader is used in this manner, MathWorks does not store, process, or transmit personally identifiable information or confidential data in connection with MATLAB Grader. If customers have chosen to integrate the company's services with a third-party service, MathWorks may store authentication information received from the third-party service, in addition to information that MathWorks normally collects for its web site and online products and services.

For students and personnel at educational institutions that elect to use a federated identity management system, such as Shibboleth, the institution directs the user to a portal where the user signs in. After sign-in, MathWorks receives information from the institution including the user's identifier and organizational affiliation. If provided by the institution, MathWorks also receives the user's name and email address. The user then sets up his or her own MathWorks account, which is pre-populated with this information.

Customer Data Collection and Management

The user's name, email address, country, and the reason for use of MathWorks products and services are required to create a MathWorks account. This information is provided by either the user or the user's organization at the time the account is created. When users are signed in with their MathWorks account, MathWorks can link their login and usage with licenses and subscriptions to MathWorks products and services to which the users have access.

For two-step verification, users provide an email address or phone number that is used for the purpose of sending verification messages.



The system contains technology that may send user experience information to MathWorks both in the course of normal usage and in the event of a software crash. This technology causes the system to send messages to MathWorks over the Internet that may contain network, device, license, and usage information. User experience information transmitted may include the products, features, and services accessed, length of session, errors that occurred, IP address, a license identifier, and the user's email address. MathWorks has technical and organizational restrictions in place that limit access to user experience information.

When users store files using the system, they are stored in MathWorks AWS cloud environment. If users are working offline, the files are stored on their own device until they are back online. Files stored online can only be accessed by the user who stored them, unless the user chooses to share the files with others inside or outside the user's organization. Select MathWorks personnel serving in certain information technology roles have access to files stored online for purposes limited to deployment, backup, and recovery operations. These personnel have signed confidentiality agreements.

External user security commitments and how customer data is handled is published in customer privacy statement and online service agreement.

Sub-Service Organizations

MathWorks utilizes Amazon Web Services (AWS) (sub-service organization) to provide cloud-hosting services, including physical security and environmental safeguards, to support the MathWorks environment.