

# MoMA Electronic Records Archive (MERA)

## The Museum of Modern Art

Preservation Strategy | Last revised January 27, 2016

### Purpose

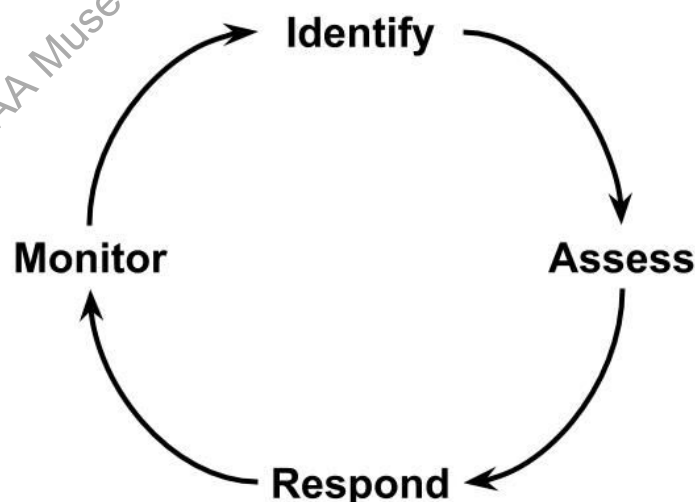
The Preservation Strategy of MERA summarizes the underlying principles and concepts of the program's preservation infrastructure. The principles outlined here inform the development, implementation, and maintenance of policy, procedure, and infrastructure that constitute the service.

### Preservation Mandate

MERA is mandated to preserve the authenticity, renderability, and understandability of the Museum's electronic records for the long-term or the duration of their scheduled retention period. To the best of their ability, the preservation services of MERA protect collected digital records from common threats to their longevity, usefulness, and meaning.

### Risk Management

Preservation is undertaken as a risk management process that ensures the longevity and understandability of records through controlled mitigation of common threats to digital information. Digital preservation actions are developed and implemented in response to identified risks and available resources. These are allocated according to the risks' estimated severity. MERA follows a typical risk management cycle as outlined below:



This process begins with the **identification** of existing and emerging threats to electronic records within internal external operating environments. These include manmade and environmental dangers, as well as internal systematic errors. Identified risks are **assessed** for their potential severity to determine the amount of resources to allocate to their mitigation. Mitigation practices are put in place in **response** to the risk assessment. Finally, mitigation practices are **monitored** for their ongoing correctness and effectiveness.

The application of this process extends to all elements of preservation planning including policy, procedure, and infrastructure development. The cycle continues to ensure proper and effective response to all threats over time.

## Authenticity and Integrity

MERA emphasizes the authenticity and integrity of the original, official record and its content. Content is maintained as received, in its original format or in a manifestation that remains true to the content of the original copy. Preservation actions that require creation of a new manifestation to support the long-term accessibility of encoded content are undertaken as a last resort and with the minimal amount of alteration to the content's significant properties possible.

Original copies of submitted records may be held in perpetuity to retain the record in its official, authentic form, in case future technologies enable access. Authenticity is maintained through thorough documentation of the record as received and collection of comprehensive metadata documenting the full history of the record from the moment of submission, including the relationship between the original and any subsequent manifestations made for preservation or access.

## Metadata

Effective metadata management is recognized as a key element of a successful preservation infrastructure. MERA collects and captures administrative, descriptive, preservation, and technical metadata to support the preservation and access functions of MERA's services. MERA uses international standards as the basis of its metadata schema, including Dublin Core, PREMIS, and METS.

All records managed by MERA systems are applied a unique identifier to link all elements of archival packages across system components and storage locations.

MERA automates the creation and use of metadata as much as possible.

## Service Levels

MERA's services encompass two levels of preservation:

- **Bit-level:** Preservation of a digital object's bit stream, ensuring the submitted object remains fixed in the form of its original submission.
- **Content:** Preservation of the content information encoded within the record's bit stream, including relevant contextual and semantic information supporting its interpretation.

The level of preservation applied to a digital record is dependent on the technical quality of digital objects and the completeness (according to predefined data models) of metadata submitted to the repository. The full extent of MERA's content preservation services is applied to all formats supported by the Preservica system. For those formats that cannot be profiled and migrated by the system, MERA provides full bit-level services to ensure the long term fixity and authenticity of the original record as received.

### Research and reference copies

Museum staff often collect extensive research resources to aid in selection and planning for exhibitions and acquisitions. These resources, while important to our understanding of exhibitions and collection materials, are not created by the Museum and are therefore not applied the same preservation levels and consideration as official Museum records. These materials will be retained for future reference and applied bit preservation service levels in a form that retains their usefulness but does not necessitate the retention of multiple copies, including originals, preservation, and access copies. For this reason, such reference materials are normalized upon ingest to a suitable format for long term preservation and access. MERA's bit preservation services are applied to ensure the accessibility and fixity of these assets over time.

## Bit-level Preservation Services

### Authenticity and File Fixity Monitoring

MERA assumes responsibility for the authenticity and fixity of a record's bit stream at the point of submission. Verification of authenticity and fixity of electronic records is carried out through the creation of checksums upon submission and regular audits over time. Results of ongoing fixity audits are recorded in the preservation history of each record.

### Storage Management

Effective storage management is central to a successful digital preservation environment. Through collaboration with the MoMA infrastructure team and relevant service providers, MERA undertakes the following storage management protocols:

- Monitoring of the health of all infrastructure elements for deterioration or impending obsolescence of technology
- Application of uniform procedures for migration of data from old to new storage mechanisms
- Oversight of the environmental conditions (heating and cooling) of the storage facilities
- Retention of multiple copies of Museum records in geographically separate storage locations
- Management of increasing storage capacity requirements to account for ongoing creation and acquisition of Museum records
- Ongoing optimization of infrastructure elements in response to developments in storage and computing technology
- Uniform practices for testing and implementation of new infrastructure elements
- Security protocols protecting against unwanted access in both digital and physical environments
- Logging and monitoring of access to Museum records in both physical and virtual environments

MERA uses cloud storage services provided by Amazon Web Services subcontracted through Preservica. Completion of the protocols above is contingent on configuration of the Preservica system and the scope of services provided by each vendor as documented in the service level and customer agreements of Amazon Web Services and Preservica.

### Format Characterization

To ensure files received by the preservation environment are the format they purport to be, MERA conducts format characterization upon ingest of submitted files. This is an initial establishment of authenticity (e.g. the file is what it claims to be) and enables the system to properly monitor the obsolescence of formats and render the content of records.

### Encryption

MERA is aware of certain liabilities inherent in the automated encryption of data as conducted by Amazon's storage services. To mitigate these risks, local copies of Museum records will be maintained in Museum storage infrastructure with no encryption applied.

## Content Preservation Services

### Obsolescence Monitoring

MERA monitors the viability of all formats of Museum records in the repository, using multiple inputs to classify formats as obsolete. These include Preservica's format registry (built on the [PRONOM](#) technical registry), as well as communication and collaboration with experts in the field of digital preservation and the program's designated community. Obsolescence monitoring is undertaken as a preemptive exercise to identify potential threats to a format's viability in advance of true obsolescence.

## Migration

If a format is classified as obsolete, affected records are designated for migration to a new format according to the following criteria:

- Format is open source and well-documented, or widely adopted with broad support from the owner of the license
- Format does not introduce extraneous dependencies for preservation or access
- Format is supported by common transcoding tools in case future migration is necessary
- Migration will not alter significant properties of the encoded content

Format migrations undergo rigorous testing and quality assurance procedures to ensure adherence to the above principles before application in the MERA production environment.

Migration is undertaken as a last resort for file formats with wide adoption in current Museum operations. MERA will consider potential forward migration of common file formats that are regularly updated (e.g., Microsoft Office, Adobe, and CAD formats) to maintain their usefulness within the current operating environment. No migration events will occur through automated processes.

Preemptive migration to new formats upon ingest (known as normalization) occurs for those formats that cannot be easily preserved in their current state, such as complex digital objects with multiple interrelated parts. Normalization is undertaken in order to maintain the ability to effectively and efficiently perform future preservation actions on these complex file types. Normalization targets are selected according to the migration criteria above. Additionally, reference materials are normalized to manage storage and preservation planning requirements of important non-records materials not generated by the Museum.

For those formats that cannot be migrated or normalized by Preservica or other transcoding tools, MERA provides bit preservation services for the original record as received.

## Version Control

MERA recognizes that the active lifecycle of some records may persist beyond the date of its submission to the MERA repository. Managing and tracking alterations of records in the repository is essential to the authentic preservation of a record's content.

A version of a record is defined as a substantial change to the content or form of an official copy of a record. These are distinct from manifestations generated for preservation or access purposes. Records may have multiple versions prior to submission to the repository or additional versions may be added post-ingest. The most recent, or current, version is always identified as the official version of that record. Version control is managed through detailed metadata records, recording the relationships between and progression of versions. MERA retains all

versions of permanent Museum records. Only the original and current versions of temporary records are retained. MERA retains a metadata record of disposed, superseded versions of temporary records to maintain the version history of such records over time.

## Disaster Recovery

MERA is committed to continuous operations of its preservation and access services, barring unforeseen manmade or natural disasters. A disaster recovery plan ensures the effective and timely restoration of all system components should they be affected or interrupted. Disaster recovery is undertaken with the intention of returning MERA to optimal operations without any undue loss of Museum records. Disaster recovery procedures are thoroughly vetted and tested to confirm their effectiveness and establish familiarity amongst staff involved in recovery proceedings.

SAA Museum Archives Section Working Group Example