SLUBArchiv.digital

Notes Before Completing the Application

We have read and understood the notes concerning our application submission.

True

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

CORE TRUSTWORTHY DATA REPOSITORIES REQUIREMENTS

Background & General Guidance

Glossary of Terms

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type. Select all relevant types from:

Library, Archive

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Brief Description of Repository

The Saxon State and University Library (SLUB) [1] is the archive library of the Free State of Saxony/Germany and the university library of Technische Universität Dresden (TUD). SLUB is among the largest academic libraries in Germany. Further details and key figures are published at [2].

SLUB is a state-owned enterprise with a legal basis in the „Gesetz über die Sächsische Landesbibliothek – Staats- und Universitätsbibliothek Dresden vom 17. Dezember 2013“ (SLUBG (2013-12-17) [3]; SaechsPresseG: §11/3,5,7 (2013-12-17) [4]). SLUBG §2 determines the statutory tasks („mission“) and the collection activities („scope“) of SLUB. It includes the obligation to collect, archive and preserve digital documents related to Saxony, indispensable digital library material owned by the Free State of Saxony, and digital research publications of the TUD. In order to meet these obligations, SLUB decided to establish and to operate SLUBArchiv.digital as an in-house digital long-term archive for digital documents. This decision was endorsed by SLUB’s general management. The existence of SLUBArchiv.digital is directly linked to the statutory tasks of SLUB. SLUB's specialist departments define the collection criteria for their designated communities (researchers, students, university staff, and citizens). Their range and depth of expertise ensures that all collection, digitisation and preservation activities are appropriate to the mission of SLUB. Further information can be found at [5].

SLUBArchiv.digital uses ExLibris Rosetta as its archival information system (AIS) [6]. Rosetta [7] is specifically configured for each application-specific preservation workflow. It is complemented by a submission application that implements workflow-specific processing steps in the pre-ingest and post-access phases. SLUBArchiv.digital covers the five OAIS functional entities: ingest, data management, archival storage, administration and access. It is designed as a dark archive. Access is limited to authorized staff. The designated community has no direct access to the archive holdings. Instead, it is entitled to use presentation copies that are available in SLUB's presentation systems.

The following activities (1, 2) are subject of this CTS certification.

Activity 1) In-house digitization and preservation of print works and manuscripts

SLUB's in-house digitization workflow [8] is a process of digitizing paper-based media, such as print works, manuscripts, etc. from SLUB's library collection and from collections of Saxon cooperation partners. SLUB uses an in-house installation

of the workflow software Kitodo.Production [9] to support this digitization process. In the last step of the Kitodo.Production workflow, the output (metadata, archival copies) is exported to SLUBArchiv.digital (archival copies, metadata) and Kitodo.Presentation (presentation copies, metadata). In the export to SLUBArchiv.digital, the archival copies and associated metadata are packaged into submission information packages that are submitted to SLUBArchiv.digital. The structure of the submission information packages is defined by a publicly available specification that is maintained by SLUBArchiv.digital. Presentation copies belonging to SLUB's library collection are added to SLUB's digital collections [10], where they can be accessed by external end users/consumers. Presentation copies belonging to collections of Saxon cooperation partners are added to Sachsen.Digital [11], where they can be accessed by external end users/consumers.

Activity 2) Digitization and preservation of audio-visual material

SLUBArchiv.digital preserves retrodigitized film, video, and audio material belonging to the cultural heritage of the Free State of Saxony. The digitization of these materials follows guidelines published by SLUBArchiv.digital. SLUB's specialist department for Music and A/V Media creates submission information packages that contain the digitized media objects and associated metadata and submits them to SLUBArchiv.digital.

Links / References

[1] https://www.slub-dresden.de/en

[2] https://www.slub-dresden.de/en/our-profile

[3] https://www.revosax.sachsen.de/vorschrift/13857-SLUBG

English summary:

Law on the Saxon State and University Library

§1 determines SLUB's type of organisation (state-owned enterprise) and location (Dresden)

§2 determines the statutory tasks („mission“) and the collection activities („scope“) of SLUB. It includes the obligation to collect, archive and preserve digital documents related to Saxony, indispensable digital library material owned by the Free State of Saxony, and digital research publications of the TU Dresden

§3...§7: regulations regarding SLUB's executive board, administrative council, economic governance, and basic administrative rules

[4] https://www.revosax.sachsen.de/vorschrift/4197-SaechsPresseG

English summary:

Saxon law on press

§1...§10, §12...§17: freedom of the press, press activity without prior authorisation, public functions of the press, duty of diligence of the press, etc.

§11/3,5,7:

regulation regarding the legal deposit for analogue and digital publications: one deposit copy of publications must be delivered free of charge to SLUB in case it is published, disseminated or otherwise made publicly accessible under the Saxon law on press, within one month after the publication

the term "publications" in the Saxon law on press includes analogue and digital publications

deposit copies of digital publications must be delivered in compliance with the technical standards and procedures defined by SLUB; software and tools required for the presentation, storage, use or long-term preservation of a deposit copy must also be delivered, with the exception of standard software

[5] https://www.slub-dresden.de/en/our-profile/library-organization

[6] https://slubarchiv.slub-dresden.de/das-archivsystem/technische-infrastruktur

English summary:

The web page describes the major parts of the technical infrastructure of SLUBArchiv.digital, the operation of the infrastructure in cooperation between SLUB and ZIH, administrative domains (permanent storage: ZIH, Archival Information System: SLUB) and names the main products used for the technical implementation (ExLibris Rosetta, IBM Spectrum Protect, IBM Spectrum Scale / General Parallel File System (GPFS), NetApp disk storage systems and IBM tape storage systems).

[7] http://exlibrisgroup.com/products/rosetta-digital-asset-management-and-preservation/

[8] https://slubarchiv.slub-dresden.de/slub-workflows/kitodo-workflow

English summary:

The web page provides an overview of the Kitodo-Workflow. It states 50+ years as the period in time in which SLUB guarantees the availability of the digital objects resulting from the workflow. The availability will be achieved through long-term archiving with content-preservation. It names "reading and viewing", "machine processability", "utilisation of

bibliographic data", and "reproduction" as the anticipated future usage scenarios. The last part of the document names the significant properties of the digital objects that were identified as being essential for the future usage scenarios, thereby defining the goals of all preservation measures that will be applied to them.

[9] https://www.kitodo.org/en

[10] https://digital.slub-dresden.de/en/digital-collections

[11] https://sachsen.digital/sammlungen

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
Accept

Brief Description of the Repository's Designated Community.

As SLUB's in-house digital long-term archive, the users and designated communities of SLUBArchiv.digital are identical to those of SLUB's specialist departments and their Saxon cooperation partners. The specialist departments that submit via the activities to be certified are the Department for Manuscripts, Old Prints, and Regional Studies (activity 1) and the Department for Music and A/V Media (activity 2). Their designated communities are researchers, university staff, and students in the field of humanities, including, but not limited to

- Cultural Studies
- History
- History of Architecture
- History of Art
- Linguistics
- Literary Studies
- Musicology
- Religious Studies
- Digital Humanities.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

Level of Curation Performed. Select all relevant types from:

C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
Accept

Comments

During the ingest process, the digital objects are enriched with technical metadata extracted from data files. The Rosetta archiving software records any preservation events that occur during a digital object's lifecycle and affect its long-term preservation. Rosetta stores these events in the digital objects' metadata. The level of curation performed by SLUBArchiv.digital is "enhanced curation" (C). Rosetta supports AIP Updates. With AIP updates, data files and metadata of archived intellectual entities (IE) can be modified. This enables producers or the SLUBArchiv.digital itself to perform data-level curation. The curation level includes data additions, replacements and metadata corrections. Furthermore, Rosetta supports preservation planning and execution, which is a necessary tool for format migration. Rosetta creates a new version of the IE for each AIP update. All versions of an IE are permanently stored in SLUBArchiv.digital and can be retrieved and stored independently within SLUBArchiv.digital. Since Dissemination Information Packages (DIPs) are not generated until requested by a consumer, these reflect the current version status of the AIP packages.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
Accept

Insource/Outsource Partners. If applicable, please list them.

The storage infrastructure for the permanent storage, on which SLUBArchiv.digital is based, is provided and operated by the Center for Information Services and High Performance Computing (Zentrum für Informationsdienste und Hochleistungsrechnen, ZIH) of the Technische Universität Dresden. TUD/ZIH is the only partner involved in SLUBArchiv.digital. SLUBArchiv.digital understands the vital importance of this partnership. The basis for the partnership is a contract (cooperation agreement) between SLUB and ZIH. This contract covers all aspects of the provisioning and operation of the repository’s permanent storage by ZIH. Specific requirements of digital long-term preservation, such as taking evolving requirements regarding permanent-storage design into account in hardware refresh plans, detailed reporting, notification of SLUB about any technical or organizational changes that may occour, and continuity aspects (see

R3 for details) are part of this contract. The contract contains an availability SLA.

Certification requirements for which ZIH/TUD provides parts of functionality/service are R3, R9, R15 and R16. To our knowledge, TUD/ZIH does not hold a CoreTrustSeal certification.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
Accept

Summary of Significant Changes Since Last Application (if applicable).

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

Other Relevant Information.

The following activities (3, 4) are *not* subject to this CTS certification. They are only mentioned for the sake of completeness and in order to provide a full picture of SLUBArchiv.digital.

Activity 3) Digitization and preservation services for print works and manuscripts of Universitätsbibliothek Leipzig (UBL)

SLUBArchiv.digital receives submissions originating from the UBL digitization workflow for digitizing paper-based media, such as print works, manuscripts, etc. in the context of the Saxon State project "Landesdigitalisierungsprogramm". UBL uses the workflow software Kitodo.Production [7] to support this digitization process. Once the UBL digitization workflow is finished for a document, the resulting data are exported. Export targets are UBL's preservation workflow and an IIIF-capable image server. The preservation workflow packages the digitized documents and associated metadata files into submission information packages. They are submitted to SLUBArchiv.digital. The structure of the submission information packages is defined by a publicly available specification that is maintained by SLUBArchiv.digital [12]. UBL can access its archived data at any time through a batch job mechanism provided by SLUBArchiv.digital. External end users/consumers access the digitized documents via the IIIF-capable image server and UBL's Mirador viewer (see [12]).

Activity 4) Preservation services on behalf of and in cooperation with the Saxon State Office "Landesamt für Umwelt, Landwirtschaft und Geologie"

SLUBArchiv.digital undertakes the task of digital long-term preservation of digitized dossiers and georeferenced digitized print works of the Saxon State Office "Landesamt für Umwelt, Landwirtschaft und Geologie". The state office has an own tenant in SLUB's in-house installation of the workflow software Kitodo.Production [7] to support this process. After processing in Kitodo.Production, the resulting data are exported. Export targets are the Kitodo preservation workflow and Kitodo.Presentation. In the Kitodo preservation workflow, the digitized documents and associated metadata files are packaged into submission information packages. They are submitted to SLUBArchiv.digital through uploading. The structure of the submission information packages is defined by a publicly available specification that is maintained by SLUBArchiv.digital [12]. External end users/consumers get access to the digitized documents via Kitodo.Presentation (see [13]).

Links / References

[12] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten - document title: "SIP Spezifikation für automatischen Ingest SLUBArchiv"

English summary:

The document specifies the Submission Information Package (SIP) used for the automatic processing of digital data objects (intellectual entities) by SLUB's submission application. The format used (BagIt) and all components of a SIP (descriptive metadata, administrative metadata including unique identifiers, mandatory metadata fields, checksums, data files) are named and explained. Where necessary, examples and references are added for better understanding. Different sections cover the SIP structure required for first ingest, AIP full updates, and AIP metadata-only updates. The document is detailed enough to enable producers to build SIPs that can be submitted to SLUBArchiv.digital, either manually or through the implementation of software tools.

[13] https://digital.ub.uni-leipzig.de/mirador/index.php
[14] https://www.digas.sachsen.de/

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

ORGANIZATIONAL INFRASTRUCTURE

1. Mission/Scope

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital does have an explicit mission regarding the preservation of data in its domain. The mission statement is published (see [1]). The level of approval that the mission receives is manifested by the strategy whitepaper "SLUB 2025: Wissen teilen - Menschen verbinden. Strategie der Sächsischen Landesbibliothek – Staats- und Universitätsbibliothek Dresden" [2]. This strategy whitepaper defines the medium-term guidelines and goals for the evolution of SLUB towards a modern library. By 2025, SLUB will provide an appropriate blend of digital and classical library services around its analogue and digital stocks. The strategy whitepaper names the operation of a digital long-term archive as a cornerstone for storing and preserving SLUB's digital collections. In addition, digital long-term archiving is mentioned as a focal area of IT development activities undertaken by SLUB.

SLUBArchiv.digital is operated as a dark archive for digital library stocks. Its task is to preserve each digital object in its responsibility by implementing bitstream and content preservation measures. It acts on behalf of SLUB's specialist departments. Access to the archive is strictly limited to authorized SLUB library staff. The designated community has no direct access to the archive holdings. Instead, it is entitled to use presentation copies that are available in SLUB's presentation systems.

Links / References

[1] https://slubarchiv.slub-dresden.de/

English summary:

SLUBArchiv.digital is the digital long-term archive of SLUB. Its legal mandate includes the long-term preservation of digital

documents (Law on the Saxon State and University Library, §2). It preserves SLUB's digital library stocks. Typical material types are manuscripts, prints, maps, drawings, photos, films, and sound recordings. The digital long-term preservation performed by SLUBArchiv.digital is based on well-established and widely accepted concepts. It ensures that the digital heritage of the Free State of Saxony is preserved over long periods of time.

[2] https://nbn-resolving.org/urn:nbn:de:bsz:14-qucosa2-357501

English summary:

This strategy whitepaper defines the medium-term guidelines and goals for the evolution of SLUB towards a modern library. The paper discusses opportunities and challenges that libraries face in a digital society, derives strategic guidelines that focus on the need for interactive spaces for learning and research, user-oriented library services for researchers and citizens, educational offers, offers and services around non-textual/digital materials, openness in thought and action as core values, open science, and networking as success factors. The strategy whitepaper names the operation of a digital long-term archive as a cornerstone for storing and preserving SLUB's digital collections. In addition, digital long-term archiving is mentioned as a focal area of IT development activities undertaken by SLUB.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

2. Licenses

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Accept

Response:

SLUB complies with intellectual property rights regulations, specifically copyright. The general terms of use are published at [1]. The majority of SLUB's documents are under the Creative Commons License CC-BY-SA 4.0, "Rights reserved - free access" or carry "Public Domain Mark 1.0" whenever applicable. CC-BY-SA 4.0 allows to reproduce and to distribute the content, to adapt and build upon the material for different purposes, as long as the users credit SLUB as their source and license their new creations under identical terms. Documents that carry Public Domain Mark 1.0 are free of known restrictions under copyright law. Some digital documents, e.g. those of other institutions, are licensed with "Rights reserved - free access". They are free of charge for academic and private purposes, provided that the source is acknowledged completely. The commercial use of these documents may be subject to charge and requires prior authorizaiton of the rights' holder. There is a compliance officer at SLUB who monitors compliance with contracts and laws (see [2], keyword "compliance"). When SLUB becomes aware of misuse, it contacts the corresponding person or organization.

All legal information (copyright information, legal permissions, legal restrictions) applicable to a digital object is captured as part of the workflows that are subject to this certification (print works and manuscripts, audio-visual materials, see R0). The legal information is added to the digital object's metadata and exported to SLUBArchiv.digital as a mandatory part of the SIP. SLUBArchiv.digital requires all legal information to be encoded in an archivable XML dialect developed specifically for this purpose. The specification of this XML dialect and its storage location inside the SIP is published at [3].

Since the SLUBArchiv.digital is operated as a dark archive, end users cannot access the content directly. Only authorized personnel that is knowledgeable in interpreting this information can trigger DIP exports for workflows/materials in their responsibility. These actions are logged. The process is described in the current version of the workflow specification at [4].

The presentation systems of SLUB display legal notices and license notices to the user.

Links / References

[1] https://nutzungshinweis.slub-dresden.de/en

[2] https://www.slub-dresden.de/en/our-profile/library-organization/contact/divisions-of-the-head-office

[3] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Rechteauszeichnung"

English summary:

The specification of the XML-based rights labeling language used by SLUBArchiv.digital. The language enables producers

to express copyright status, permissions, and legal restrictions that apply to the digital object contained in a SIP. Mandatory elements are named. A comprehensive list of examples is provided. The document is detailed enough to enable producers to prepare rights labeling documents, either manually or through the implemantation of software tools. The XML schema is linked.

[4] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Workflow Spezifikation für automatisierte Interaktionen mit dem SLUBArchiv"

English summary:

This document describes the workflow that producers and consumers must follow when interacting with SLUBArchiv.digital. The document is structured into five parts. The first part places the interactions in context of the OAIS model, instructs producers regarding the preparational steps (data and metadata) before SIP creation, and informs about the mandatory set of metadata. The second part describes the technical details of the ingest (transfer protocols, network shares to be used), including the point in time at which the transition of responsibility from the producer to the archive takes place. Part three describes the technical details of the ingest (transfer protocols, network shares to be used, request syntax, filename syntax). Parts four and five deal with error handling mechanisms (ingest and access), and special cases (access to a specific AIP version, changes of external identifiers, delete requests). The document is detailed enough to enable producers and consumers to fully interact with SLUBArchiv.digital.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

3. Continuity of access

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

Evidence regarding the medium-term plans for SLUBArchiv.digital until the year 2025 can be found in the strategy whitepaper „SLUB 2025“ published by the director general of SLUB. According to this strategy whitepaper, SLUBArchiv.digital and its further development are focal areas of IT development. Regarding the continuity of operation, SLUBArchiv.digital depends on yearly funding and permanent staff positions. It does not depend on funding that is limited in time. The material costs of SLUBArchiv.digital are financed from SLUB’s global budget. The annual budgetary allocations for material costs depend on the size of SLUB's global budget, which does vary over time. From the staff appointment scheme of SLUB, permanent positions with stable financing have been commited to the following roles: management of the long-term preservation unit, a long-term preservation expert and technical staff for the administration of the hard- and software components that belong to the digital long-term archive. Further details regarding staffing and work organization can be found in R5.

The existence of SLUBArchiv.digital is directly linked to the statutory tasks of SLUB that do also define SLUBArchiv.digital's mission and scope (see R0 for details). For this reason, an unexpected withdrawal of funding or a shift of host institution interests is highly unlikely. There are no explicit long-term plans that go beyond the statutory mandate of SLUB. They do, in fact, depend on future political decisions that are not foreseeable. In case the Free State of Saxony should fundamentally change the scope and mission of SLUB regarding the collection and preservation of digital objects, these changes would first be reflected in law and implemented afterwards. It is highly likely that updated law would include a succession regulation for the archival storage of digital objects now stored in SLUBArchiv.digital. The political decision would be guided by article 11 of the Saxon Constitution [2], which legally requires the Free State of Saxony to protect and preserve its cultural assets and to commit itself to ensuring that they remain in Saxony. Therefore, a succession planning that goes beyond the statutory tasks is not reasonable.

Contracts regulating the cooperation with external partners are in place, the most important one being the cooperation agreement about the provisioning and operation of the repository’s permanent storage by the Zentrum für Informationsdienste und Hochleistungsrechnen (ZIH), the data center of Dresden University of Technology. Continuity aspects are considered in the contract design, i.e. the contract is open-ended and renews automatically unless explicitly terminated. The contract clearly allocates the responsibility for all bitstream storage efforts to ZIH, including the appropriate renewal, repair and monitoring of hardware and software necessary for the operation of the permanent storage. Further contractual duties of ZIH include system monitoring, documentation of activities and regular reporting to SLUB. Reporting is implemented through automatically generated reports and as part of weekly physical/virtual meetings between SLUB and ZIH. ZIH's compliance with contractual obligations is audited annually by SLUB. In case of termination, a clause in the contract that guarantees the continuation of the operation of the permanent storage by ZIH until all data has been migrated to a new storage provider reduces risks to a minimum.

To discover any risks that may affect the continuity of access, SLUBArchiv.digital performs an internal annual risk analysis covering systematic risk identification, risk assessment, and risk documentation. It covers a comprehensive range of risk categories related to long-term preservation including, but not limited to, organisational risks (human mistakes, loss of information, delay in information flow, human resources, IT security, political decisions), safety risks (disasters caused by fire, water, heat, surge, blackout, hacking), file format risks, legal risks, and technical risks (storage hardware, storage media, long-term preservation software, loss of data due to technical failure) [1]. The results are recommended actions to minimize or eliminate the identified risks. The risk analysis and the recommended actions are reviewed by the management and influence decision-making and planning.

Retention periods and the deletion policy are elaborated in R8. Details on the exit plan can be found in R10.

Links / References

[1] 2021 - Risikoanalyse und Handlungsempfehlungen SLUBArchiv.digital (Note: This confidential document is a SLUB intranet page. It falls into the category of "sensitive and other internal documentation". A copy of the intranet page is made available to the CoreTrustSeal Secretariat info@coretrustseal.org to provide the required evidence.

[2] https://www.revosax.sachsen.de/vorschrift/3975-Verfassung#a11

English summary:

The Constitution of the Free State of Saxony. Article 11 (https://www.revosax.sachsen.de/vorschrift/3975-Verfassung#a11) - Promotion of Culture, Art, Science and Sport requires the Free State of Saxony to protect and preserve its cultural assets and to commit itself to ensuring that they remain in Saxony.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

4. Confidentiality/Ethics

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

The processing of data at SLUB takes place in conformance with the requirements imposed by the EU General Data Protection Regulation (GDPR 2016/679). The procurement of services and equipment happens in accordance with all rules and regulations that are applicable for public services in the Free State of Saxony. In the activities to be certified (see R0), only works which have already been published and for which digitization is legal, are digitized and submitted to SLUBArchiv.digital. Adherence to applicable legal and ethical standards is constantly being checked in the process of publishing documents by the employees of the specialist department of SLUB. The implementation of specific procedures for the management of data with disclosure risk is out of scope for SLUBArchiv.digital. It belongs to the area of responsibility of managers (board of directors, heads of specialist departments, project steering committees) that are involved in the planning and execution of digitisation projects. The clarification of the legal framework, including copyright status, permissions to produce and use the data (e.g. through the conclusion of contracts, court decisions, licenses) and the identification of applicable legal restrictions (e.g. personal rights, unconstitutional content, child protection) is part of their project activities.

SLUBArchiv.digital is operated as a dark archive. Only authorized and knowledgeable library personnel has direct access to the data stored in the archive. SLUBArchiv.digital supports the documentation and preservation of legal information through a mandatory rights labeling of SIPs. For this purpose, SLUBArchiv.digital has defined and published an XML-based rights labeling language. The detailed specification of this language, which allows depositors to express copyright status, permissions, and legal restrictions that apply to the digital object contained in a SIP, is published at [1]. To provide the required expressiveness, language structure and vocabulary have been defined by SLUBArchiv.digital in collaboration with SLUB's specialist departments. Additionally, feedback on the specification was contributed by other institutions. Rights labeling is mandatory for all SIPs submitted to SLUBArchiv.digital. SIPs that do not contain a valid rights labeling document are automatically rejected. The rights labeling document is stored in the permanent storage as part of the AIP. Its content is preserved. Beyond validation and preservation, SLUBArchiv.digital has no further obligations regarding the handling of the rights labeling document. The assurance of its semantic correctness and completeness is solely in the responsibility of the producer. Considering and enforcing its content is in the responsibility of the personnel/department that is authorized to access data stored in the archive.

The designated community has no direct access to the archive holdings, since SLUBArchiv.digital is operated as a dark archive. Only authorized and knowledgeable library personal employed in SLUB's specialist departments and the team of SLUBArchiv.digital are able to start a DIP creation process. All access requests from the designated community must be addressed to SLUB's specialist departments. After the DIP has been created, it is in the responsibilty of the specialist departments to evaluate the rights labeling it contains in order to make a decision about whether or not the DIP can be made available to the requestor, and to inform the requestor about the rights situation of the digital object contained in the DIP. In case the team of SLUBArchiv.digital should - for whatever reasons - receive an access request directly from the designated community, it will always refer the requestor to the specialist departments.

Links / References

[1] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Rechteauszeichnung"

The specification of the XML-based rights labeling language used by SLUBArchiv.digital. The language enables producers to express copyright status, permissions, and legal restrictions that apply to the digital object contained in a SIP. Mandatory elements are named. A comprehensive list of examples is provided. The document is detailed enough to enable producers to prepare rights labeling documents, either manually or through the implemantation of software tools. The XML schema is linked.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

5. Organizational infrastructure

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital needs funds for material costs and staff. Material costs include software (software licenses, maintenance), hardware, the service contract for the operation of the permanent storage at ZIH, meetings, and training. Staff is needed for concept development, preservation activities, consultancy for in-house project partners, administration of the archival information system software, storage and server hardware administration, software development (submission application, validators, OAI harvesters), workflow supervision incl. technical analysis, and management.

The existence of SLUBArchiv.digital does not depend on the availability of project funds. There is stable, long-term financing for the personnel costs of the permanent staff. The material costs are covered by the budget funds of SLUB (see R3). In Saxony, budgets are planned and allocated for a period of two years. This limits SLUB's finanical planning horizon for material costs to two years.

The budget of SLUBArchiv.digital is supplemented by project funds for material costs and project staff. Such time-limited project funds are primarily used for the design and implementation of project-specific workflows, including development/configuration of submission applications, format validation tools, and the identification and documentation of significant properties.

The expertise in the team of SLUBArchiv.digital is appropriate to its mission. The team's preservation expert holds a master's degree in Bibliotheks- und Informationswissenschaft. The other members of the team are computer scientists that hold at least one university/college degree or possess a solid professional qualification as IT specialist. Permanent staff in this team is employed for the fulfillment of core tasks (administration of storage hardware and archival information system, knowledge building, preservation activities within manageable limits, submission application development, management, steering of external service providers). The team members usually assume different roles. Not all of them are directly related to long-term preservation. Project staff is working on project-specific tasks such submission application development, reporting, and communication with project partners. The actual effort for digital preservation activities varies over time and depends on the particular situation. To manage its work, the team uses agile techniques. The permanent staff allocated for SLUBArchiv.digital is 2.3 FTE [1]. This does not include staff resources for data curation. Data curation is performed by the employees of SLUB's specialist departments as part of their daily work activities.

Training and professional development is available through external courses, preferably offered by the training center HSF Meissen (see [2]), but also through in-house courses and self-study.

Affiliations exist with nestor (network of expertise in long-term storage of digital resources in Germany) and ExLibris (national and international Rosetta user groups). They are appropriate to the mission of SLUArchiv.digital, because the groups' members share similar interests and face comparable challenges. The affiliations give SLUBArchiv.digital the possibility to take influence on the future development of long-term preservation.

Links / References

[1] https://slubarchiv.slub-dresden.de/das-archivsystem/organisatorische-und-personelle-einbindung

English summary:

The web page documents the organisational and personnel situation of SLUBArchiv.digital. The permanent staff FTEs allocated for SLUBArchiv.digital are listed, together with groups of task ("producer support, workflow administration, technial analyst, troubleshooting", "operation and administration of the AIS", "software development of submission application, AIS plugins and the AIS itself (via Rosetta User Groups)", "conceptual development of digital long-term preservation and workflows", "management").

[2] https://www.hsf.sachsen.de/fortbildungszentrum/

English summary:

Home page of the Training Centre of the Free State of Saxony, the central and interdepartmental training institution for the employees of the Saxon state administration.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

6. Expert guidance

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either inhouse or external, including scientific guidance, if relevant).

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital is part of the IT department of SLUB. The employees of the SLUBArchiv.digital are computer scientists and librarians. They draw on the expertise of in-house advisors from SLUB's specialist departments at any time. There is no extra advisory board. Regular training and external feedback is ensured through membership in nestor, participation in nestor working groups and nestor events, but also through participation in the user community of the AIS software Rosetta, as well as through own publications and presentations, for example at the Librarian's Day (Bibliothekartag). An overview can be found at [1]. SLUBArchiv.digital promotes the further development of digital long-term preservation and extends own skills and capablities through its participation in task area 4 of NFDI4Culture (Consortium for Research Data on Material and Immaterial Cultural Heritage within the National Research Data Infrastructure Germany) [2].

The team of SLUBArchiv.digital and its external partner Zentrum für Informationsdienste und Hochleistungsrechnen, who is responsible for the provisioning and operation of the repository’s permanent storage, possess thorough technical expertise in file formats being archived, in format validation tools, in the proper operation of the AIS software Rosetta, in building and operating software for OAI harvesting and pre-ingest processing, and in the operation of complex storage systems.

The regular preparation of handouts and publication of delivery specifications ensures that producers can prepare for adjustments in the SLUBArchiv.digital. This process is documented at [3]. SLUBArchiv.digital collects requirements and feedback from the designated communities and experts through the following means:

- interviews with domain-experts to identify and document the significant properties of materials/object types (see also [4])

- organisation of events and surveys targeting the long-term preservation requirements of the NFDI4C community (university institutes, art and music colleges, academies, galleries, libraries, archives, museums, individual researchers)

- in-house surveys and information events targeting the long-term preservation requirements of SLUB's specialist departments and their designated communities

- professional exchange with digital long-term archives operated by partner organisations

- active participation in digitization projects that submit to SLUBArchiv.digital

- SLUB "Knowledge bar" (online advice on digital long-term preservation by individual appointments) [5]

- publication of discussion papers at [3] ("ERGÄNZENDE DOKUMENTE")

SLUBArchiv.digital thoroughly analyses feedback and new requirements. The ways in which the feedback is incorporated or new requirements are addressed is specific to their nature. They typically range from including minor modifications of already published handouts in their next release (see R12) to the implementation of entirely new workflows.

Links / References

[1] https://slubarchiv.slub-dresden.de/veroeffentlichungen-mitwirkung-und-open-source

English summary:

The web page lists current and past cooperations of SLUB in the area of digital long-term preservation. A link to open source software developed and published by SLUBArchiv.digital is provided, as well as a list of publications.

[2] https://nfdi4culture.de/

[3] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten

English summary:

The web page is used to publish the technical standards for the submission of digital documents to SLUBArchiv.digital. It provides basic knowledge regarding archival value decisions and general technical prerequisites that must be fulfilled by all types of materials in order to enable their successful long-term preservation by SLUBArchiv.digital (provisioning of checksums, adherence to file format requirements imposed by SLUBArchiv.digital). The quality checks performed during ingest (checksum-based integrity checks, file format identification and validation, use of file formats supported by SLUBArchiv.digital, virus checks, extraction of technical metadata) are named and explained. A digital object is only accepted into SLUBArchiv.digital if it passes all quality checks.

The release plan for all technical standards published by SLUBArchiv.digital and their naming convention is explained (two releases per year, in March and in September).

A link list of documents containing all technical standards / specifications published by SLUBArchiv.digital exists on the page. The links point to their latest version. Announcements of upcoming and discontinued specifications are also published on the page. The file format specifications for the file formats relevant for the activities to be certified are "Handreichung retrodigitalisierte Monographien" ("Handout retro-digitised monographs") and "Handreichung RetroVideoFilm" ("Handout retro-digitised film and video"). The handouts contain technical details regarding the proper encoding of the information in the allowed formats.

Discussion papers published by SLUBArchiv.digital, the exit strategy, and a glossary are linked under the heading "Ergänzende Dokumente".

[4] https://git.slub-dresden.de/digital-preservation/significantproperties

[5] https://www.slub-dresden.de/en/visit/knowledge-bar

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

DIGITAL OBJECT MANAGEMENT

7. Data integrity and authenticity

R7. The repository guarantees the integrity and authenticity of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

Multiple hash functions are applied automatically to calculate a checksum for each file in the SLUB digitization workflow. Permitted hash functions are MD5 (Message-Digest Algorithm; [1]) and SHA-512 (National Institute of Standards and Technology, FIPS Publication 180-3: Secure Hash Standard, October 2008). Providing the MD5 and SHA-512 checksums is mandatory. In the pre-ingest phase of both preservation workflows, the submission application verifies these checksums and adds the MD5 and SHA-512 checksums to the METS metadata. During ingest processing, the archival information system Rosetta validates this checksum (see Rosetta Staff User's Guide, section "Fixity in Rosetta with an External Storage Layer") and additionally generates SHA1 (US Secure Hash Algorithm 1, standard document [2]), SHA-256 and CRC32 (Cyclic redundancy check) checksums, which it adds to the metadata. The METS/MODS metadata file of a digital object is stored along with all other master files, so checksums are stored in Rosetta’s data management system and in the archival storage.

While checksums are held on the file level, the tape storage system maintains its own checksums using a technology called Logical Block Protection (LBP) that adds Cyclic Redundancy Check (CRC) checksums to every block. It runs fixity checks every time data is read from or written to storage tapes.

SLUBArchiv.digital does have a strategy for data changes. Producers are able to modify existing AIPs through a well-documented AIP update mechanism (see [3]). Rosetta creates and manages multiple AIP versions. Each time an AIP is changed, a new version is created. Typical reasons for changes in productive workflows are (1) preservations actions, (2) corrections initiated by the production, e.g. a single page is scanned anew, or (3) additions, e.g. of an OCR processing result. Older versions of digital objects remain stored and accessible for staff users. Checksums are calculated and validated for new files as described above. All changes to an AIP are documented in its metadata (i.e. the audit trail). Rosetta uses dedicated metadata based on the PREMIS data model (see [4] and [5] for details).

During preservation planning activities, the significant properties of different versions of the same file will be compared (see list of significant properties at [6]; in German).

The processes for checking the AIPs' integrity are described in R9. Rosetta supports dead-reference identification, which allows for the detection of broken or missing references to files in the AIPs. By regularly executing this function, manipulation and unintentional changes in the storage can be detected in time.

The strict coupling of the published requirements relating file formats with the configuration profiles of the file fomat validators ensures that all data and metadata deemed necessary reach the archive in the agreed upon and documented quality (see also [7]).

Basic provenance metadata of the original data are already filed in the library catalogue. In the digitization workflows, these data are copied to the metadata of the digitized object. The authenticity of a digitized object is checked by library staff. In most cases, they compare pages of print works and manuscripts in the digitized object with the physical master

object. In some projects, third-party institutions only make the digitized object available to SLUB. In such cases, the authenticity check is solely based on a comparison of the digital object with the metadata recorded in the library catalogue. For digitized analogue film and video, the quality of the digitized material is manually checked on a random basis. The effort spent for the comparisons depends on the nature of the project and the value of the original.

There is no use case that requires SLUBArchiv.digital to store and preserve links between datasets that coexist in the archive. To enable clear and unambiguous references to digital objects in the archive, SLUBArchiv.digital allows producers to add unique identifiers (URN, ppn) to SIPs. These unique identifiers become part of the AIP's metadata (see R11 and R13 for details).

Usually, the depositor of the digitized objects is SLUB itself. Contact persons to third party institutions that provide data are well known and no identity check is performed.

Links / References

[1] http://www.ietf.org/rfc/rfc1321.txt

[2] http://tools.ietf.org/html/rfc3174

[3] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Workflow Spezifikation für automatisierte Interaktionen mit dem SLUBArchiv"

English summary:

This document describes the workflow that producers and consumers must follow when interacting with SLUBArchiv.digital. The document is structured into five parts. The first part places the interactions in context of the OAIS model, instructs producers regarding the preparational steps (data and metadata) before SIP creation, and informs about the mandatory set of metadata. The second part describes the technical details of the ingest (transfer protocols, network shares to be used), including the point in time at which the transition of responsibility from the producer to the archive takes place. Part three describes the technical details of the ingest (transfer protocols, network shares to be used, request syntax, filename syntax). Parts four and five deal with error handling mechanisms (ingest and access), and special cases (access to a specific AIP version, changes of external identifiers, delete requests). The document is detailed enough to enable producers and consumers to fully interact with SLUBArchiv.digital.

[4] https://knowledge.exlibrisgroup.com/@api/deki/files/59860/Rosetta_AIP_Data_Model.pdf

[5] https://www.loc.gov/standards/premis/registry/premis-project_name.php?proj_ID=21

[6] https://slubarchiv.slub-dresden.de/slub-workflows/kitodo-workflow/

English summary:

The web page provides an overview of the Kitodo-Workflow. It states 50+ years as the period in time in which SLUB guarantees the availability of the digital objects resulting from the workflow. The availability will be achieved through long-term archiving with content-preservation. It names "reading and viewing", "machine processability", "utilisation of bibliographic data", and "reproduction" as the anticipated future usage scenarios. The last part of the document names the significant properties of the digital objects that were identified as being essential for the future usage scenarios, thereby defining the goals of all preservation measures that will be applied to them.

[7] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/

English summary:

The web page is used to publish the technical standards for the submission of digital documents to SLUBArchiv.digital. It provides basic knowledge regarding archival value decisions and general technical prerequisites that must be fulfilled by all types of materials in order to enable their successful long-term preservation by SLUBArchiv.digital (provisioning of checksums, adherence to file format requirements imposed by SLUBArchiv.digital). The quality checks performed during ingest (checksum-based integrity checks, file format identification and validation, use of file formats supported by SLUBArchiv.digital, virus checks, extraction of technical metadata) are named and explained. A digital object is only accepted into SLUBArchiv.digital if it passes all quality checks.

The release plan for all technical standards published by SLUBArchiv.digital and their naming convention is explained (two releases per year, in March and in September).

A link list of documents containing all technical standards / specifications published by SLUBArchiv.digital exists on the page. The links point to their latest version. Announcements of upcoming and discontinued specifications are also published on the page. The file format specifications for the file formats relevant for the activities to be certified are "Handreichung retrodigitalisierte Monographien" ("Handout retro-digitised monographs") and "Handreichung RetroVideoFilm" ("Handout retro-digitised film and video"). The handouts contain technical details regarding the proper encoding of the information in the allowed formats.

Discussion papers published by SLUBArchiv.digital, the exit strategy, and a glossary are linked under the heading "Ergänzende Dokumente".

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

8. Appraisal

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

The collection profile of SLUB is the basis for the selection of works to be digitized, presented in SLUB's digital collection and ingested into SLUBArchiv.digital. The frame of the collection profile is specified by SLUBG (2013-12-17) §2/1,2,3 [1], which names saxon, german and international literature, music sources (special collection), photographs (special collection), scientific literature for university research and teaching at the Dresden University of Technology, literature on Saxony, picture and sound recordings of Saxony and statutory copies (born-digital and analogue publications published in Saxony). The selection of digital objects to be archived is always based on SLUB's legal mandate and performed by domain experts in SLUB's specialist departments. Consequently, IEs that do not fall within the collection profile are never ingested.

SLUBArchiv.digital publishes format and submission guidelines [2] that are normative for producers. Detailed format guidelines ("Handreichungen") define the file formats accepted by SLUBArchiv.digital for different material types. Every format guideline contains a brief discussion of the format's suitability for long-term preservation. The published guidelines also include requirements regarding the minimal set of metadata that must be provided as part of every IE to ensure its interpretability. The guidelines are reviewed every six months. SLUBArchiv.digital ensures that data and metadata contained in SIPs meet the guidelines published by the SLUBArchiv.digital. Conformance to the guidelines is tested by an automated check during the ingest. The test ensures that all data and metadata contained in a SIP are complete, correct and valid. Metadata is checked based on its underlying schema. Data is checked based on the file format specification. The validation tools used for data and metadata are updated together with the published guidelines to guarantee consistency. If necessary, AIPs are revalidated and repaired via Preservation Planning and Action. SIPs that violate the

guidelines of the SLUBArchiv.digital are referred back to the producers. A list of file formats that are considered to be suitable for long-term preservation by SLUBArchiv.digital is published at [2].

The retention period for the digital objects that are ingested in the activities to be certified is unlimited.

Removing collection items from SLUBArchiv.digital happens in extremely rare cases only. These cases are governed by a SLUB-internal policy [3] that is published in the intranet of SLUB. Decision making and impact assessment for such removals is perfomed by authorized library personal of SLUB's specialist departments. It does not fall within the scope of SLUBArchiv.digital. Only the execution of the deletion itself is performed by SLUBArchiv.digital.

The case that a producer no longer wishes to use the services of the SLUBArchiv.digital is regulated individually in a takeover agreement.

Links / References

[1] https://www.revosax.sachsen.de/vorschrift/13857-SLUBG#p2

English summary:

Law on the Saxon State and University Library

§1 determines SLUB's type of organisation (state-owned enterprise) and location (Dresden)

§2 determines the statutory tasks („mission“) and the collection activities („scope“) of SLUB. It includes the obligation to collect, archive and preserve digital documents related to Saxony, indispensable digital library material owned by the Free State of Saxony, and digital research publications of the TU Dresden

§3...§7: regulations regarding SLUB's executive board, administrative council, economic governance, and basic administrative rules

[2] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/

English summary:

The web page is used to publish the technical standards for the submission of digital documents to SLUBArchiv.digital. It provides basic knowledge regarding archival value decisions and general technical prerequisites that must be fulfilled by all types of materials in order to enable their successful long-term preservation by SLUBArchiv.digital (provisioning of checksums, adherence to file format requirements imposed by SLUBArchiv.digital). The quality checks performed during ingest (checksum-based integrity checks, file format identification and validation, use of file formats supported by SLUBArchiv.digital, virus checks, extraction of technical metadata) are named and explained. A digital object is only

accepted into SLUBArchiv.digital if it passes all quality checks.

The release plan for all technical standards published by SLUBArchiv.digital and their naming convention is explained (two releases per year, in March and in September).

A link list of documents containing all technical standards / specifications published by SLUBArchiv.digital exists on the page. The links point to their latest version. Announcements of upcoming and discontinued specifications are also published on the page. The file format specifications for the file formats relevant for the activities to be certified are "Handreichung retrodigitalisierte Monographien" ("Handout retro-digitised monographs") and "Handreichung RetroVideoFilm" ("Handout retro-digitised film and video"). The handouts contain technical details regarding the proper encoding of the information in the allowed formats.

Discussion papers published by SLUBArchiv.digital, the exit strategy, and a glossary are linked under the heading "Ergänzende Dokumente".

[3] Grundlegende Festlegungen SLUBArchiv für genutzte Archivinformationssysteme (Note: This document is a SLUB intranet page. It does not fall into the category of "sensitive and other internal documentation". A copy of the intranet page is made available to the CoreTrustSeal Secretariat info@coretrustseal.org to provide the required evidence.).

English summary:

Among basic specifications regarding the number of IEs per SIP, the number of representations held by Rosetta per AIP, etc., item 7 of the document contains the policy that governs the deletion of AIPs. The policy states that AIPs cannot be deleted. Deletion requests can only lead to AIPs being marked as deleted. Individual reasons for deletion must always be recorded in a comprehensible manner. To minimize risks, the dual control principle is mandatory when executing the deletion. AIPs marked as deleted are not made available to producers or consumers and are never subject to preservation actions. AIPs marked as deleted are taken into account in the exit strategy. In the case of a migration to a new archival information system, a rudimentary AIP is generated in the new system to serve as proof of deletion. In case of duplicate removal, metadata-events containing references pointing to all affected AIPs (including the one that remains unmarked) are added to every affected AIP in order to ensure permanent traceability.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

9. Documented storage procedures

R9. The repository applies documented processes and procedures in managing archival storage of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital does have a clear understanding of all storage locations. The permanent storage is currently managed cooperatively by SLUB and ZIH/TUD. It is physically located at the two data centers of the Zentrum für Informationsdienste und Hochleistungsrechnen (ZIH) of TUD. A cooperation agreement about the provisioning and operation of the repository’s permanent storage by the ZIH defines the major technical and organisational responsibilities of both partners. Details relevant for a sufficient common understanding of the current technical implementation, which is explained in the following, are documented on SLUB intranet pages that are jointly maintained by SLUB and ZIH.

Each AIP is stored in the archive's permanent storage. The permanent storage holds at least three copies of each AIP at two geographically separated data center buildings (site 1, site 2) on disk and tape storage systems. The producer uses the "hasConservationReason" flag in the SIP's administrative metadata to indicate that an IE is archived for conservation reasons (e.g. born-digital material). If this flag is set, four copies of the AIP are automatically created.

When an AIP is handed over to the permanent storage, it is initially stored in an IBM General Parallel File System (GPFS) cluster that spans the two data centers of ZIH. The synchronous mirroring feature of GPFS is used to create two initial copies of each file that is passed to the permanent storage, one at each site. Files stored in the GPFS cluster are migrated to the final storage locations. In the print works and manuscripts workflow, all files are migrated to one disk pool and two tape pools. The workflow for audio-visual materials is almost identical, except that all video files are migrated to three tape pools for economic and performance reasons. This migration process is implemented by the IBM Spectrum Protect software (TSM) and currently runs three times per day, eventually creating the three permanent copies of each AIP. The disk pool and the first tape pool are located at site 1. The second tape pool is located at site 2. The usage of a disk pool ensures performant access to the AIPs with a large number of small files. The tape pools are protected by Logical Block Protection (LBP, a CRC checksum technology). The architecture of the permanent storage is published at [1].

The integrity of archival copies is checked according to the policy described in [2]. The policy is implemented as part of the submission application that is developed and operated by SLUBArchiv.digital. The source code is maintained in the internal Gitlab code repository of SLUB. Over every year, we perform an automated integrity test on a 1% random sample of all AIPs stored in the permanent storage. The integrity test consists of two parts: dead reference identification and fixity check. Dead reference identification is performed for all files in the sample in order to detect missing files. The fixity check is performed for all files in the sample in order to detect corrupt files. Dead reference identification and fixity checks are implemented in our digital preservation software and based on the file lists and checksums that it stores in the AIP metadata. The integrity test is performed on a single copy of the files only. In case of errors, the check is manually extended to AIPs that have been ingested near to the ingest date of the AIPs affected by the errors. Erroneous files are replaced by undamaged copies (out of the three copies that exist) as soon as the root cause has been fixed. To avoid massive peak loads, the execution of the integrity test is spread over the year. Spreading is implemented by excuting the test daily on a fraction (1/365) of all items in the random sample. Errors identified by the integrity test are reported to the administrators and the manager of SLUBArchiv.digital by e-mail. It is obvious that the significance of this test can be increased by checking the integrity of all three/four archival copies of an AIP instead of only one. We do therefore plan to extend the current test in the near future.

The computing center's standard processes for monitoring and handling of tape- and disk-based storage systems apply. Any real-time monitoring data is accessible by administrators at ZIH and SLUB via a professional monitoring tool. The monitoring of the permanent storage generates daily reports on TSM errors, tape drive usage, tape mounts, and the overall volume of data migration between the storage pools. These reports allow to judge the overall health status of the permant storage. They do also enable us to detect a wide range of problems and errors early on. The TSM error report includes errors encountered by the TSM during tape and disk operation, e.g. damaged disks, damaged tapes, deteriorating tapes, or faulty tape drives. Thus it contains essential indicators for the necessity to take action and implement countermeasures. The data migration volume report gives insights into migration runs. It allows for detection of inconsistencies between the amount of data written by the digital preservations software and the amount of data that is actually migrated to the storage pools. Tape drive and tape mount statistics enable performance problem analysis, since they reveal dependencies between actions triggered in digital preservation software and the reaction of the permanent storage.

Malfunctions are recorded and documented centrally on the SLUB intranet. This includes causal research and countermeasures. These are assessed once a year as part of a risk assessment that is oriented at the DRAMBORA method [3]. Risks are categorized into technical, organizational, legal, and file format risks. For each of the identified risks, counter-strategies are elaborted. The risks' severity levels provide guidiance for the priorization of their counter strategies.

Links / References

[1] https://slubarchiv.slub-dresden.de/das-archivsystem/technische-infrastruktur

English summary:

The web page describes the major parts of the technical infrastructure of SLUBArchiv.digital, the operation of the infrastructure in cooperation between SLUB and ZIH, administrative domains (permanent storage: ZIH, Archival Information System: SLUB) and names the main products used for the technical implementation (ExLibris Rosetta, IBM Spectrum Protect, IBM Spectrum Scale / General Parallel File System (GPFS), NetApp disk storage systems and IBM tape storage systems).

[2] https://slubarchiv.slub-dresden.de/das-archivsystem/erhalt-der-korrektheit/

English summary:

The web page lists the measures implemented by SLUBArchiv.digital to maintain the correctness of the bitstream ("bitstream preservation"). Checksums are used to verify the correctness of the files. These checksums are entered into the metadata in the pre-ingest, checked during the ingest and transferred to the Rosetta software. Regular checks of a representative part of the data in the permanent storage are performed based on these checksums. As an additional measure, TSM monitoring based on the capabilities of IBM Spectrum Protect and the logical block protection (LBP) of the IBM tape dives are used to ensure and check data integrity. The last part of the document briefly explains the methods used to correct checksum errors.

[3] http://repositoryaudit.eu/

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

10. Preservation plan

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital has a documented approach to preservation. This approach is guided by the assumption that long-term preservation can only be guarenteed for digital objects with documented significant properties and the use of file formats for which a sufficient amount of format knowledge, processing tools and permanent storage exists. It is implemented through various organizational and technical measures that are executed by skilled personnel with clear role assignments. The most important organizational measures taken are an appropriate staffing of the team with specialists for long-term preservation and system administration, regular risk assessments, regular publications of guidelines for accepted file formats based on format watch, the determination and recording of significant properties together with domain experts from SLUB's specialist departments, the rejection of unsupported file formats or invalid files during ingest and the operation of an AIS that is able to perform preservation actions, e.g. format migration. The most important technical measures are the operation of a permanent storage that is able to hold at least three copies of a digital object at two different locations and regular, automated integrity checks. Detailed documentation of these measures is published under [1], [2] and [3].

The level of responsibility for the preservation of each item is understood. It is defined by the task of preserving all significant properties that have been identified for an item, together with its bit-stream.

SLUBArchiv.digital addresses the threat of obsolescence for hardware, storage media, archive information software and file formats. Hardware obsolence is addressed through the renewal of hardware components before their end of support dates. Storage media in the permanent storage is replaced in the course of storage hardware renewals. Because the lifecycle of the used storage hardware (specifically tape drives) is shorter than that of the compatible storage media (tapes), the risk of data loss through age-related media errors is minimal. In case the AIS Rosetta or the software provider ExLibris should vanish from the market, SLUBArchiv.digital has prepared an exit plan that would be carried out in such a case. The exit plan contains measures to ensure that the data and metadata managed by Rosetta are extracted and remain accessable and searchable until an alternative AIS becomes available. To ensure a smooth transition, SLUBArchiv.digital builds up knowledge about alternative solutions, such as Archivematica, to be able to re-establish normal operation in the shortest time possible. The exit plan is documented and follows the concepts described in the master thesis "Übertragbarkeit von Archivinformationspaketen zwischen Langzeitarchivsystemen als Teil der Exit-Strategie" [4]. The exit plan is not fully available to the general public, but the overall approach and core technical details are published (see [5]). Semiannual tests ensure that the exit plan can be executed as designed and finishes in an adequate runtime.

File format risks/obsolence will be addressed by format migration, using the preservation planning and action functions of Rosetta. During ingest processing, data formats are identified using PRONOM [6] and validated for their adherence to their respective specifications and stricter validation profiles. Technical metadata are extracted and added to the AIP. In order to test and document Rosetta's preservation planning and action functionality, a preservation action for a format migration from PDF 1.4 (fmt/18) to PDF/A (fmt/354) has been planned and executed. Updates of Rosetta that span a major version release will also trigger a test of the preservation planning and action functionality, and all outcomes are recorded. The process of preservation planning and actions is documented publicly (see [2]).

For the long-term preservation services that SLUBArchiv.digital provides for SLUB (see R0), a formal contract between the depositors and the repository is not necessary. The tasks assigned by SLUB to its organizational unit "Referat für Infrastruktur und Langzeitverfügbarkeit", which operates SLUBArchiv.digital, are equivalent to such a contract. Contracts with third parties that use SLUBArchiv.digital as a service do contain the necessary contractual regulations. The same applies to the rights to copy, transform, and store the items. As a dark archive, SLUBArchiv.digital only provides access to the owner of items or to personnel that has been authorized by the owner. The management and enforcement of access rights that go beyond are out of scope for SLUBArchiv.digital. However, SLUBArchiv.digital requires depositors to add legal information about the copyright status (mandatory), legal restrictions (if applicable) and permissions regulated by contracts or licenses (if applicable) to every IE.

The transfer of custody and responsibility handover is clearly defined as the point in time at which an IE has been sucessfully stored in the permanent storage of SLUBArchiv.digital. This is documented and published as part of the workflow specification (see [7]). To enable depositors to inform themselfs about the status of their submissions, SLUBArchiv.digital provides technical means (protocol files, web service interface).

Links / References

[1] https://slubarchiv.slub-dresden.de/das-archivsystem/erhalt-der-korrektheit/

English summary:

The web page lists the measures implemented by SLUBArchiv.digital to maintain the correctness of the bitstream ("bitstream preservation"). Checksums are used to verify the correctness of the files. These checksums are entered into the metadata in the pre-ingest, checked during the ingest and transferred to the Rosetta software. Regular checks of a representative part of the data in the permanent storage are performed based on these checksums. As an additional measure, TSM monitoring based on the capabilities of IBM Spectrum Protect and the logical block protection (LBP) of the IBM tape dives are used to ensure and check data integrity. The last part of the document briefly explains the methods used to correct checksum errors. Further details can be found in R9.

[2] https://slubarchiv.slub-dresden.de/das-archivsystem/erhalt-der-interpretierbarkeit/

English summary:

The web page explains SLUBArchiv.digital's measures to preserve the interpretability of the digital objects (content preservation). Interpretability of a digital object depends on the file format used. File formats can become obsolete. A file format is considered "risky" if there is only a small number of programs left that can display or render it. In case a file format is assessed as "risky", SLUBArchiv,digital will initiate format migrations in order to ensure that the digital object remains usable in the future. The AIS Rosetta is equipped with a module to plan, test and carry out format migration procedures. The content preservation measures performed by SLUBArchiv.digital are divided into four steps: (1) Regular monitoring and weekly format risk report generation in Rosetta. (2) Preservation planning for file formats that have been identified as risky. Identification of one or more procedures to migrate all affected files from the risky format to a secure format. A list of alternative procedures that are equivalent in terms of the quality in which they preserve the significant properties is input for step (3). In step (3), the procedure with the best test run performance is declared "preservation plan". The preservation plan is executed in step (4). Due to Rosettas AIP versioning mechanism, the original files always remain unaffected and accessible.

[3] https://slubarchiv.slub-dresden.de/das-archivsystem/organisatorische-und-personelle-einbindung

English summary:

The web page documents the organisational and personnel situation of SLUBArchiv.digital. The permanent staff FTEs allocated for SLUBArchiv.digital are listed, together with groups of task ("producer support, workflow administration, technial analyst, troubleshooting", "operation and administration of the AIS", "software development of submission application, AIS plugins and the AIS itself (via Rosetta User Groups)", "conceptual development of digital long-term preservation and workflows", "management").

[4] https://nbn-resolving.org/urn:nbn:de:bsz:14-qucosa2-79514

[5] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Exit-Strategie Rosetta"

English summary:

The document describes the precautionary measures that are intented to ensure the availability of the archived data in the event of a loss of the Rosetta system, together with the procedure that SLUBArchiv.digital will follow in such a case. Technical details like the target data model of the AIP data, basic installation and execution instructions for the exit script, performance estimates, and hints regarding potential problems are part of the document.

[6] https://www.nationalarchives.gov.uk/PRONOM/

[7] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "Workflow Spezifikation für automatisierte Interaktionen mit dem SLUBArchiv"

English summary:

This document describes the workflow that producers and consumers must follow when interacting with SLUBArchiv.digital. The document is structured into five parts. The first part places the interactions in context of the OAIS model, instructs producers regarding the preparational steps (data and metadata) before SIP creation, and informs about the mandatory set of metadata. The second part describes the technical details of the ingest (transfer protocols, network shares to be used), including the point in time at which the transition of responsibility from the producer to the archive takes place. Part three describes the technical details of the ingest (transfer protocols, network shares to be used, request syntax, filename syntax). Parts four and five deal with error handling mechanisms (ingest and access), and special cases (access to a specific AIP version, changes of external identifiers, delete requests). The document is detailed enough to enable producers and consumers to fully interact with SLUBArchiv.digital.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

11. Data quality

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository
Accept

Response:

To ensure data quality, SLUBArchiv.digital publishes semi-annually updated versions of its handouts on data formats, archiving workflows and the structure of SIPs, as well as a list of potentially suitable longterm preservation file formats. They set the data quality standards imposed by SLUBArchiv.digital. A direct possibility for the Designated Community to comment and/or evaluate data and metadata is not intended. Feedback of the producers is taken into account in the development of these documents. Where it is possible, automated quality checks are in place to ensure that these quality standards are met before data is written to the permanent storage, e.g. during the format validation step performed by Rosetta. In addition, the employees of the SLUBArchiv.digital closely monitor the activities of the long-term archive community by participarting in the nestor network, as well as the development of file formats and associated tools for which the SLUB has assumed responsibility for long-term preservation.

Whenever new preservation workflows are established, the SLUBArchiv.digital team pays great attention to the determination of significant properties for the materials to be archived. The significant properties are identified in dialogue with the producers. Automated quality testing during ingest is performed for significant properties that map to technically measurable quality parameters. In all specifications and workflows, care is taken to ensure that suitable validators are available for file formats, including metadata formats, recognized by the SLUBArchiv.digital. With each release cycle, it is checked whether quality parameters need to be sharpened. If this is the case, data and metadata already in the archive will be adapted to the new quality standard via Preservation Planning and Action, if appropriate and possible.

Not all data quality tests can be automated, for example when it comes to quality assessments of digitised analogue media (e.g. colour accuracy of scans in comparison to the original, proper illumination, etc.) produced in the digitisation workflows. To cover these cases, scanning service providers are required to submit test scans to SLUB before they are allowed to start mass production. The quality assessment of these test scans is done manually by expert staff at SLUB, for example by SLUB's inhouse digitization center (see [1]). During mass production, test are repeated on a random basis. Completeness of the data is ensured before it is submitted to SLUBArchiv.digital. For printed matter, manuscripts, etc., there is a structuring step in the digitisation workflow, in which the scans are manually aligned with the content structure of the original. In case scans are missing, it becomes apparent here. Similiar measures to ensure the quality and completeness of data are implemented for film and video.

SLUBArchiv.digital's approach to metadata and metadata quality is highly specific to its domain, the preservation of digital library stocks. SLUBArchiv.digital distinguishes two types of metadata: administrative metadata and descriptive metadata. In short, administrative metadata is required for the proper handling of the digital objects submitted to SLUBArchiv.digital and for their understandability by the archive. Descriptive metadata contains information about the digital object itself, which is essential for the designated community.

Only the following administrative metadata fields are mandatory; they must be added to all SIPs. The metadata field "external workflow" is the identifier of the producer's workflow that created the SIP. The metadata field "external id" must

be a persistent identifier that uniquely identifies the intellectual entity contained in the SIP in the context of the producer's workflow. Both identifiers represent a composite key that uniquely identifies the AIP in the archive. It is required for the retrieval of the AIP during DIP creation as well as for AIP updates. The administrative metadata field "hasConservationReason" is used to indicate that archiving takes place for conservation reasons, like in the case of born-digitals. To inform the archive about the reason for submitting a digital object, the metadata field "archivalValueDescription" must be provided by the producers. Producers that are assigned an ISIL number must add it to the administrative metadata. SIPs that do not contain all mandatory administrative metadata are automatically rejected during ingest processing. The producer is informed about the rejection and can resubmit the SIP after correcting it.

All SIPs that are submitted to SLUBArchiv.digital are created by the producers. SLUBArchiv.digital only gives a strong recommendation to add descriptive metadata to SIPs, to an extent that is required to compile a rudimentary library catalogue, together with persistent identifiers of the digital object (urn, PPN, ...). Currently, all producers at SLUB follow this recommendation. If provided, the descriptive metadata must be encoded in the bag-info.txt of the SIP as well as in its original encoding (e.g. MODS, LIDO) in a separate metadata file. Original encoding refers to the metadata encoding that is used by the system from which the metadata has been taken during the building of the SIP. For SLUB's workflows, the central source of descriptive metadata that is put into this file is the SLUB catalogue. Tools (Kitodo.Production, SLUBArchiv.digital's SIP Builder) are used to automatically copy the descriptive metadata from the catalogue to the SIP in order to avoid errors caused by manual action. Therefore, the quality of the descriptive metadata of an AIP in SLUBArchiv.digital is identical to the metadata quality that existed in the catalogue when its SIP was created. To improve metadata quality after ingest, SLUBArchiv.digital offers producers the possibility to update the descriptive metadata using the AIP update mechanism. Quality assurance by SLUBArchiv.digital for descriptive metadata is deliberately limited to the format valdiation of the metadata file. It does not cover its content. This approach is reasonable, because the metadata is either copied from systems with own and elaborated quality control mechanisms that are maintained by domain experts of SLUB or simply consists of references (persistent identifiers) to descriptive metadata maintained by other trusted institutions. The metadata provided by the producer as part of the SIP is stored in the AIP and added to the DIP. All details and documentation regarding metadata can be found at [2] and [3].

Links / References

[1] https://www.slub-dresden.de/en/visit/digitization-on-demand/ddz

[2] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "SIP Spezifikation für automatischen Ingest"

English summary:

The document specifies the Submission Information Package (SIP) used for the automatic processing of digital data objects (intellectual entities) by SLUB's submission application. The format used (BagIt) and all components of a SIP (descriptive metadata, administrative metadata including unique identifiers, mandatory metadata fields, checksums, data files) are named and explained. Where necessary, examples and references are added for better understanding. Different

sections cover the SIP structure required for first ingest, AIP full updates, and AIP metadata-only updates. The document is detailed enough to enable producers to build SIPs that can be submitted to SLUBArchiv.digital, either manually or through the implementation of software tools.

[3] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "DIP Spezifikation für automatischen Ingest"

English summary:

The document specifies the Dissemination Information Package (DIP) generated by SLUBArchiv.digital. The used format (BagIt) and all components of a DIP (descriptive metadata, administrative metadata including unique identifiers, mandatory metadata fields, checksums, data files) are named and explained. An example is added for better understanding. The document is detailed enough to enable producers to process DIPs, either manually or through the implemantation of software tools.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

12. Workflows

R12. Archiving takes place according to defined workflows from ingest to dissemination.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

The processes of deposit and access are described in detail in the guidelines published by SLUBArchiv.digital, which are updated every six months (see [1]). Changes of workflows and specifications are conducted in regular intervals and at predefined points in time, twice a year ("release dates"). Changes are documented and published as updates of the relevant specification documents. Producers are notified via e-mail. For every change, there is a preannouncement period of six month. During the preannouncement period, producers have sufficient time to prepare for the upcoming changes before they become normative at the next release date. Through this procedure, both workflows have already been sucessfully changed to include additional types of materials such as newspapers and periodicals, special requirements for specific collections (e.g. support for additional OCR file types), numerous format specification refinements, SIP format changes, and the introduction of the rights specification language.

Library staff that is involved in this process, including the staff working in the area of digital long-term preservation, is trained accordingly (see [2]).

Links / References

[1] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/

English summary:

The web page is used to publish the technical standards for the submission of digital documents to SLUBArchiv.digital. It provides basic knowledge regarding archival value decisions and general technical prerequisites that must be fulfilled by all types of materials in order to enable their successful long-term preservation by SLUBArchiv.digital (provisioning of checksums, adherence to file format requirements imposed by SLUBArchiv.digital). The quality checks performed during ingest (checksum-based integrity checks, file format identification and validation, use of file formats supported by SLUBArchiv.digital, virus checks, extraction of technical metadata) are named and explained. A digital object is only accepted into SLUBArchiv.digital if it passes all quality checks.

The release plan for all technical standards published by SLUBArchiv.digital and their naming convention is explained (two releases per year, in March and in September).

A link list of documents containing all technical standards / specifications published by SLUBArchiv.digital exists on the page. The links point to their latest version. Announcements of upcoming and discontinued specifications are also published on the page. The file format specifications for the file formats relevant for the activities to be certified are "Handreichung retrodigitalisierte Monographien" ("Handout retro-digitised monographs") and "Handreichung RetroVideoFilm" ("Handout retro-digitised film and video"). The handouts contain technical details regarding the proper encoding of the information in the allowed formats.

Discussion papers published by SLUBArchiv.digital, the exit strategy, and a glossary are linked under the heading "Ergänzende Dokumente".

[2] https://slubarchiv.slub-dresden.de/das-archivsystem/organisatorische-und-personelle-einbindung/

English summary:

The web page documents the organisational and personnel situation of SLUBArchiv.digital. The permanent staff FTEs allocated for SLUBArchiv.digital are listed, together with groups of task ("producer support, workflow administration, technial analyst, troubleshooting", "operation and administration of the AIS", "software development of submission application, AIS plugins and the AIS itself (via Rosetta User Groups)", "conceptual development of digital long-term preservation and workflows", "management").

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

13. Data discovery and identification

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital ist operated as a dark archive for digital library stocks and does offer search facilities that are adequate to this specific mode of operation. The digital library stocks from the two activities to be certified are recorded in the SWB Online Catalogue [1] under the K10plus cataloguing rules [2], by the German National Library (DNB, Deutsche Nationalbibliothek [3]), and in SLUB's own library catalogue [4]. Both activities differ in the assignment of URNs. Activity 1 underlies SLUB's URN policy for digital objects that become part of SLUB's digital collection: A Uniform Resource Name (URN) requested from the DNB is assigned to each object and added to its catalogue entry. This URN becomes a part of the digital object's descriptive metadata and is stored in the AIP. In activity 2, only the unedited raw scan of the A/V-material is submitted to SLUBArchiv.digital. The unedited raw scan receives no URN. Only its PPN becomes a part of its descriptive metadata and is stored in the AIP.

The library catalogues offer full-blown search facilities (searching, filtering, browsing, exporting) for the metadata describing the digital objects (see [5]). MARC21 [6], an international standard in the library domain, is used to make the library catalogue available in a machine-readable format [7].

The digital objects that are long-term preserved in SLUBArchiv.digital are made available to end users via Kitodo.Presentation (see SLUB's digital collections at [8]) and SLUB's Mediathek [9]. The objects are presented in widely used file formats that are suitable online presentations and accessable for the designated community of SLUB for viewing and downloading, without the involvement of SLUBArchiv.digital. The digital objects can be searched and browsed via the library catalogue (see [6]). In addition to the metadata formats supported by the catalogue, SLUB provides an OAI-PMH interface for metadata harvesting (supported metadata formats: METS, OAI-DC, EPICUR, see [10]) for items presented in Kitodo.Presentation. To support proper citation, SLUB provides a service for generating citations from catalogue entries in different, widely used formats (see [11]). It does not recommend a specific format.

Due to the ample set of search features that are implemented by the catalogues, SLUBArchiv.digital does only implement basic search mechanisms for the purpose of quickly retrieving preservation masters within a preservation workflow. For this purpose, SLUBArchiv.digital indexes the mandantory set of administrative metadata (see R11) of each digital object. The index includes the external workflow ID and the persistent external ID. The combination of the two IDs is a persistent, unique and workflow-independend identifier for every AIP stored by Rosetta. There is a 1:1 mapping between the two IDs and the IE PID used by Rosetta as an internal identifier. Because SLUBArchiv.digital only holds the "preservation master" representation of a digital object and no derivative copies, the Rosetta IE PID is the only internal identifier required by SLUBArchiv.digital to unambiguously identify a digital object and its metadata. Details on Rosetta's AIP data model can be found in [12].

If the catalogue or the workflow systems should become permanently unavailable, e.g. in case of desasters, SLUBArchiv.digital is still able to search and retrieve AIPs based on the (unindexed) descriptive metadata that has been provided by the producer (cp. R11).

Links / References

[1] https://swb.bsz-bw.de/DB=2.1/SET=1/TTL=1/LNG=EN/

[2] https://wiki.k10plus.de/pages/viewpage.action?pageId=27361358

[3] http://www.dnb.de/EN/

[4] https://katalog.slub-dresden.de

[5] https://www.slub-dresden.de/en/catalog-help/search-help

[6] https://www.loc.gov/marc/

[7] https://wiki.k10plus.de/display/K10PLUS/Exportformate

[8] https://digital.slub-dresden.de/en/digital-collections

[9] http://mediathek.slub-dresden.de/

English summary:

Web site presenting historical and contemporary sound and film recordings from the media library (Mediathek) of SLUB.

[10] https://digital.slub-dresden.de/oai/?verb=Identify

[11] https://www.slub-dresden.de/en/catalog-help/hilfe-zum-datenexport

English summary:

Web page with help and instructions on data export from SLUB's catalogue to reference management software.

[12] https://knowledge.exlibrisgroup.com/@api/deki/files/105715/Rosetta_AIP_Data_Model.pdf?revision=1

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

14. Data reuse

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital requires producers to include a minimal set of metadata as part of every IE to ensure its interpretability by the archive. Additionally, SLUBArchiv.digital recommends producers to add a core data set of descriptive metadata to the SIP (see SIP specification and R11). If provided, the descriptive metadata must have a file format that fulfills the recognized criteria for archival file formats (see below).

In addition to the metadata provided by the producer, SLUBArchiv.digital always stores technical metadata about the digital objects as part of their AIPs. The handouts published by SLUBArchiv.digital contain a definition of the technical metadata that is collected for the digital objects covered by the handout. This definition is based on the significant properties that are of interest to consumers or intended to be preserved by the original content creator (for examples, see [1]). These significant properties are the foundation for the long-term preservation of the digital objects. Due to their importance, SLUBArchiv.digital documents the significant properties of a digital object in a structured form (XML) and stores them in the object's AIP.

During the ingest process, technical metadata about the digital object is automatically extracted and added to the AIP. To extract the technical metadata, Rosetta uses a format library (a specific and regularly updated collection of signatures generated from PRONOM and supplemented by risk assessments and tools). The format library is maintained by the Format Library Working Group, which is part of the Rosetta community. This ensures that risky (e.g. outdated) file formats are detected in time and countermeasures such as Preservation Planning and Action, e.g. format migrations, can be taken at any time. The SLUBArchiv.digital team regularly checks whether it is necessary to adapt or add PRONOM signatures for file formats.

The SLUBArchiv.digital team selects archival file formats according to recognized criteria: robustness, documentation, simplicity, wide-spread use, and openness. In its handouts, SLUBArchiv.digital publishes the file formats that must be used for specific material types (e.g, retrodigitised books, publications, retrodigitised film/audio, etc.). SLUBArchiv.digital also publishes a comprehensive list of file formats that are considered to be suitable for long-term preservation purposes due to the degree in which they fulfill the recognized criteria.

SLUBArchiv.digital is aware of the fact that continued understandability of digital objects (content information) requires producers to add descriptive metadata and to keep this metadata up-to-date, e.g. by performing corrections and additions. Furthermore, structural metadata can enhance the understandability of material like print works, manuscript, and film. SLUBArchiv.digital deliberately limits the requirements for producers to recommendations about descriptive metadata that should be added to a digital object. The recommendations are published (see [2]) and include core bibliographic metadata that must be sufficient to compile a rudimentary library catalogue for fast retrieval. The decision about the different aspects of descriptive metadata, such as the extent and format required to properly describe a digital object for the designated community is taken by SLUB's specialist departments. They act in the producer role and add the metadata to the SIP when a digital object is first ingested, and keep it up-to-date through AIP updates whenever necessary. In case the specialist departments decide to add descriptive or structural metadata to the set of significant properties of a digital object, SLUBArchiv.digital will perform technical preservation measures like format migration for these metadata files.

Together, the measures described above ensure that every digital object stored by SLUBArchiv.digital stays understandable, interpretable, and usable for the designated communities and the archive.

Links / References

[1] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/

English summary:

The web page is used to publish the technical standards for the submission of digital documents to SLUBArchiv.digital. It provides basic knowledge regarding archival value decisions and general technical prerequisites that must be fulfilled by all types of materials in order to enable their successful long-term preservation by SLUBArchiv.digital (provisioning of checksums, adherence to file format requirements imposed by SLUBArchiv.digital). The quality checks performed during ingest (checksum-based integrity checks, file format identification and validation, use of file formats supported by SLUBArchiv.digital, virus checks, extraction of technical metadata) are named and explained. A digital object is only accepted into SLUBArchiv.digital if it passes all quality checks.

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Discussion papers published by SLUBArchiv.digital, the exit strategy, and a glossary are linked under the heading "Ergänzende Dokumente".

[2] https://slubarchiv.slub-dresden.de/technische-standards-fuer-die-ablieferung-von-digitalen-dokumenten/ - document title: "SIP Spezifikation für automatischen Ingest SLUBArchiv"

English summary:

The document specifies the Submission Information Package (SIP) used for the automatic processing of digital data objects (intellectual entities) by SLUB's submission application. The format used (BagIt) and all components of a SIP (descriptive metadata, administrative metadata including unique identifiers, mandatory metadata fields, checksums, data files) are named and explained. Where necessary, examples and references are added for better understanding. Different sections cover the SIP structure required for first ingest, AIP full updates, and AIP metadata-only updates. The document is detailed enough to enable producers to build SIPs that can be submitted to SLUBArchiv.digital, either manually or through the implementation of software tools.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

TECHNOLOGY

15. Technical infrastructure

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository
Accept

Response:

SLUBArchiv.digital uses standards and reference models accepted in the long-term preservation community. Exlibris Group, the provider of our AIS, assures that it is implemented according to the OAIS reference model. Rosetta also uses METS/DC as the metadata standard for the AIPs. The DNX used by Rosetta maps preservation metadata according to the PREMIS model. See the documents at [1]. SIPs use the BagIt file packaging format (RFC 8493, [2]) which is widely accepted in the context of long-term preservation and supported by many popular long-term archiving systems, e.g. Rosetta and Archivematica. The mandatory set of metadata must be provided in the form specified by RFC 8493. For optional descriptive metadata, SLUBArchiv.digital requires depositors to use formats that fulfill the recognized criteria for archival file formats (see R14).

Hardware components and software licenses used by SLUBArchiv.digital are documented in a professional IT inventory solution ("Synetics iDoit", [3]). Detailed system documentation of the long-term archiving system operated by SLUB (Rosetta, submission applications, operating systems) and the overall system architecture is maintained in the SLUB intranet. It covers production, testing, and development systems and includes version information, version history, update protocols, instructions and checklists for recurring administrative tasks, and faults (time of occurence, cause, remedy actions, lessons learned, involved personnel). Documentation of the permanent storage (components, software in use, configuration, change logs, contact personell) is provided by our partner ZIH and stored in SLUB intranet. An architecture overview is published at [4].

At least once a year the hardware and system architecture of SLUBArchiv.digital are reviewed. It is checked whether the hardware and software in use still meets the requirements of SLUBArchiv.digital and if hardware components have reached the end of their planned lifetime. If changes, upgrades or renewals are necessary, adaptations to the architecture or the replacement of systems are planned in close coordination with our partner ZIH.

Bandwidth and connectivity are sufficient to meet the demands of SLUB's designated community. SLUB is connected to the German National Research and Education Network (DFN) with a bandwith of 500 Mbit/s. The link is redundant (2

lines, 250 Mbit/s per line). DFN is the data network for science and research in Germany, thus ensuring suitability for the designated community of SLUB. Since we operate the SLUBArchiv.digital as a dark archive, it is decoupled from the presentation layer. It is therefore possible to shut down the archive in parts or as a whole to carry out maintenance without disturbance for the designated community.

SLUBArchiv.digital has made preparations to recover from the following errors and disasters: power outages that are longer than the maximum operating time of SLUBs independent power supply, loss of availability due to hardware failure, loss of data due to hardware failures or human mistakes, and partial physical destruction of its infrastructure. In case of power outages, there is a documented procedure (in electronic form and as a hardcopy) on how to safely shut down SLUBArchiv.digital and its IT infrastructure while the redundant power supply is still available. A second document (in electronic form and as a hardcopy) describes all steps necessary to safely restart SLUBArchiv.digital and its IT infrastructure. Both documents are not publicly available. Loss of availability due to hardware failures is covered by maintenance and service contracts with the hardware providers, which allows SLUB to restore operation in a time frame that depends on the agreed service levels (typically 8x5xNBD). The effects of data loss are handled by a backup concept which allows us to restore all essential parts of the long-term archiving software from backup. To prepare for a partial destruction of its infrastructure, SLUBArchiv.digital stores all data (permanent storage, backup) in two different geographical locations. In case one of the locations should be destroyed, all data is still available at the other.

Links / References

[1] https://knowledge.exlibrisgroup.com/Rosetta/Product_Documentation/990_Version_7.0

[2] https://tools.ietf.org/html/rfc8493

[3] https://www.i-doit.com/

[4] https://slubarchiv.slub-dresden.de/das-archivsystem/technische-infrastruktur/

English summary:

The web page describes the major parts of the technical infrastructure of SLUBArchiv.digital, the operation of the infrastructure in cooperation between SLUB and ZIH, administrative domains (permanent storage: ZIH, Archival Information System: SLUB) and names the main products used for the technical implementation (ExLibris Rosetta, IBM Spectrum Protect, IBM Spectrum Scale / General Parallel File System (GPFS), NetApp disk storage systems and IBM tape storage systems).

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

16. Security

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase
Accept

Reviewer 2

Comments:
3 – The repository is in the implementation phase
Accept

Response:

Generals rules and regulations regarding data protection and data security at SLUB are bindingly established and documented in the IT security concept ("IT Sicherheitskonzept", the document is confidential). SLUB has a position for an IT security officer, who is developing the IT security concept together with the head of IT department. Because the IT security concept has draft status, the compliance level for this requirement can only be 3.

The objective of SLUBArchiv.digital is to preserve the availability, integrity and authenticity of digital objects in its responsibility. The protection requirements directly emerge from this objective, namely to prevent any intentional or unintentional actions on the digital objects that have a harmful impact on their availability, integrity and authenticity. The term "unintentional actions" stands for actions that are triggered by human error or technical failures occuring without third-party interference. "Intentional actions" cover all actions that are triggered by an attacker, remote or on-premise. SLUBArchiv.digital adopts and extends the SLUB IT security concept in order to meet the objectives named above. The necessary technical and organisational measures implemented by SLUBArchiv.digital (including authentication mechanisms in use) to achieve this objective are summarized in [1].

One of the most important and highly specific extensions to SLUB's IT security concept is the annual implementation of a risk assessment that is oriented at the DRAMBORA method (see R9).

TU Dresden, the parent organisation of ZIH (our partner for the operation of the permanent storage), has an IT security officer (see [2]) and operates a CERT [3].

Links / References

[1] IT security of SLUBArchiv.digital: Summary technical and organizational measures relevant for CTS (Note: This confidential document falls into the category of "sensitive and other internal documentation". A copy is made available to the CoreTrustSeal Secretariat info@coretrustseal.org to provide the required evidence.)

[2] https://tu-dresden.de/tu-dresden/organisation/gremien-und-beauftragte/beauftragte/it-sicherheitsbeauftragter?set_language=en

[3] https://tu-dresden.de/tu-dresden/organisation/zentrale-universitaetsverwaltung/dezernat-3-zentrale-angelegenheiten/sg-3-5-informationssicherheit/tud-cert/index?set_language=en

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

APPLICANT FEEDBACK

Comments/feedback

These Requirements are not seen as final, and we value your input to improve the CoreTrustSeal certification procedure. Any comments on the quality of the Requirements, their relevance to your organization, or any other contribution, will be considered as part of future iterations.

Response:

Reviewer Entry

Reviewer 1

Comments:

SLUB did a very good job in improving an already good first submission and all confidential information provided was sufficient to warrant the compliance levels where indicated. I recommend accepting the submission.

Reviewer 2

Comments: