Proof-of-Concept for BR of BRs with requirements Matrix

Paul van Brouwershaven

Director Technology Compliance

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Location of the Proof-of-Concept

- **GitHub username**: vanbroup
- **Repository**: documents
- **Branch**: brofbr

- https://github.com/**vanbroup/documents**/tree/**brofbr/**

- Scripts are in the directory “tools” (including a README)
- The unmodified source files in the directory “docs” (as usual)
- The transformed files (the proposed working format) in the directory “structured”
- The example output in the directory “output”

BR of BRs with requirements Matrix

Objective

Streamline and harmonize the existing baseline requirements documents within the CA/Browser Forum, with the aim of **reducing duplication** and **enhancing clarity**, by establishing a unified set of baseline requirements applicable to various certificate use cases.

Rationale

The CA/Browser Forum has developed multiple baseline requirements documents, including those for TLS certificates, code signing, S/MIME, and might develop potentially others in the future.

These documents often contain overlapping or redundant content, as they all draw **from the same** fundamental best practices initially defined in the Baseline Requirements for TLS certificates.

This redundancy results in additional work for Certification Authorities (CAs), web browsers, and auditors, as they must navigate multiple documents with sometimes slightly different wording while addressing common requirements.

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Benefits

1. **Maintenance and Updates**: A centralized baseline requirements document will facilitate easier maintenance and updates, ensuring that best practices are current and reflective of evolving security needs.
2. **Consistency**: A unified set of baseline requirements will promote consistency in certificate issuance and management practices across different use cases, making it easier to understand and adhere to.
3. **Efficiency**: With common requirements consolidated, CAs can allocate resources more efficiently, focusing on specific, detailed requirements for individual use cases without reiterating shared standards.
4. **Clarity**: With clearly identified requirements, and an overview in a spreadsheet, it becomes easy to filter and difficult to miss requirements. It also makes it easier to adopt a Governance Risk and Compliance (GRC) system.

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IPR clearance

The establishment of a “BR of BRs” will require some changes on how we operate, for example all members might need to be required to participate in a new baseline working group with its own IPR clearance.

- This proposal is not intended to solve that problem

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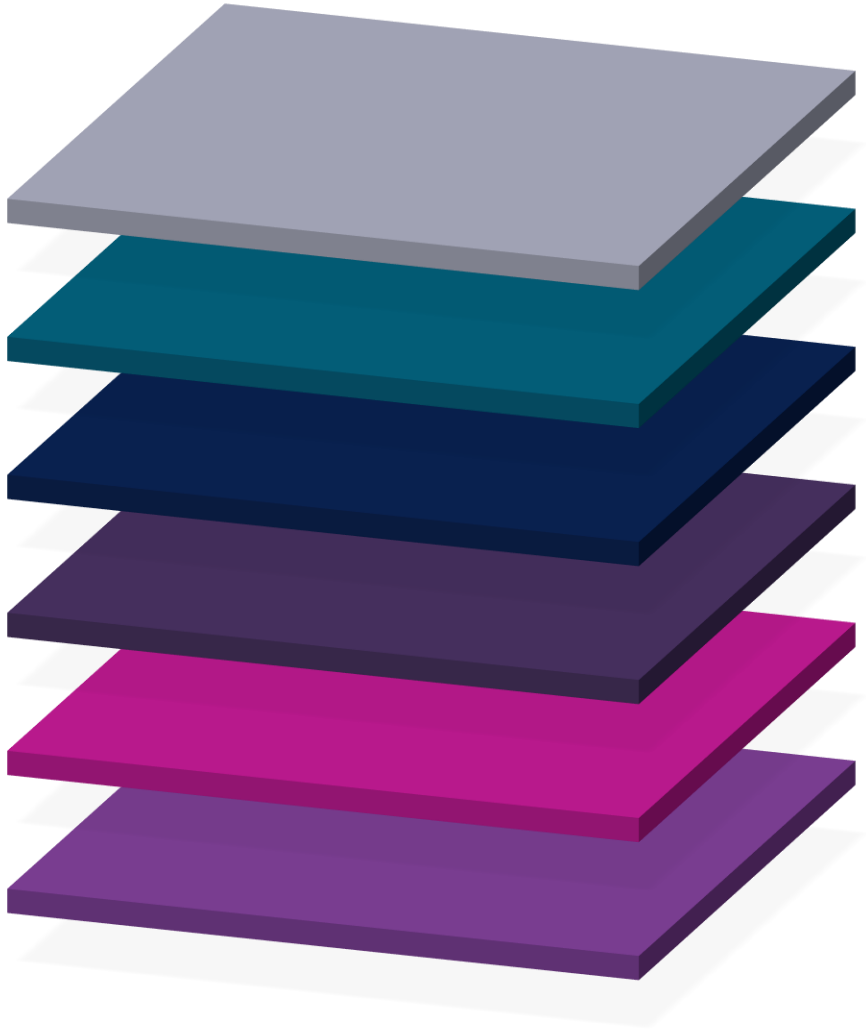
A layered approach

Extended Validation Certificate



Profile Requirements
TLS, Code Signing, S/MIME, etc.

Level of Assurance
Extended Validated (EV)

Level of Assurance
Organization Validated (OV)

Level of Assurance
Domain Validated (DV)

Network and Certificate System Security Requirements

Baseline Requirements (BR)

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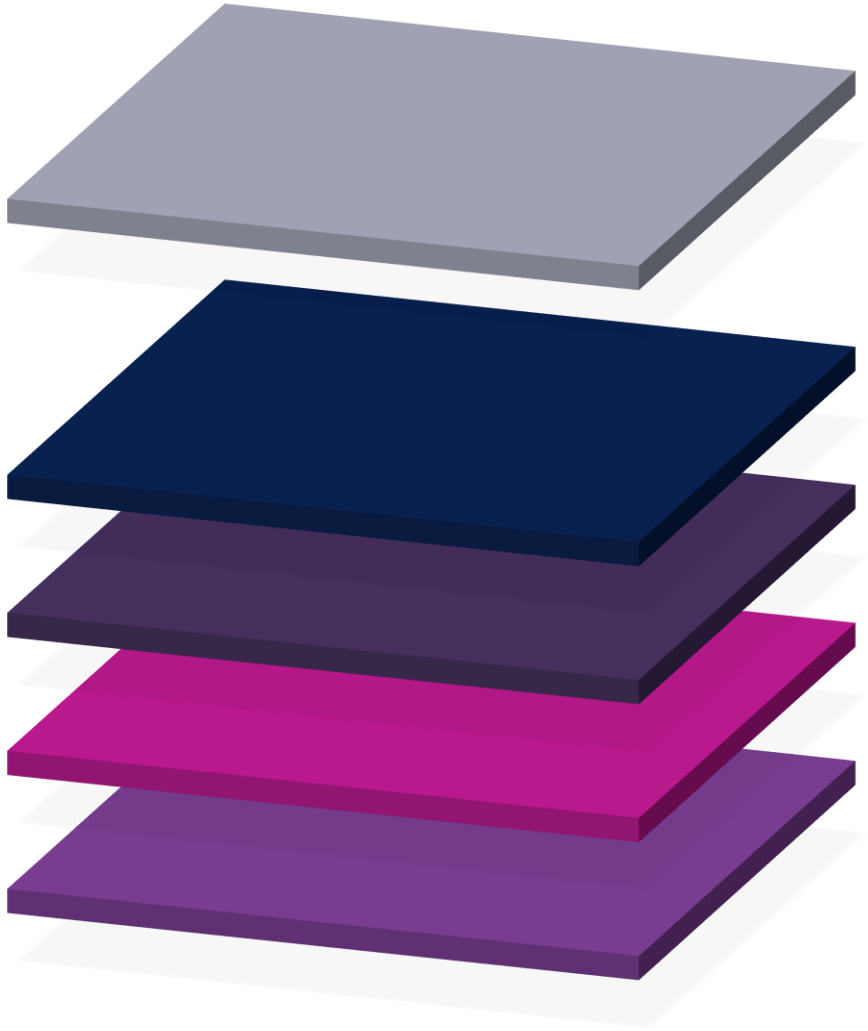
A layered approach

Organization Validation Certificate



Profile Requirements
TLS, Code Signing, S/MIME, etc.

Level of Assurance
Organization Validated (OV)

Network and Certificate System Security Requirements

Level of Assurance
Domain Validated (DV)

Baseline Requirements (BR)

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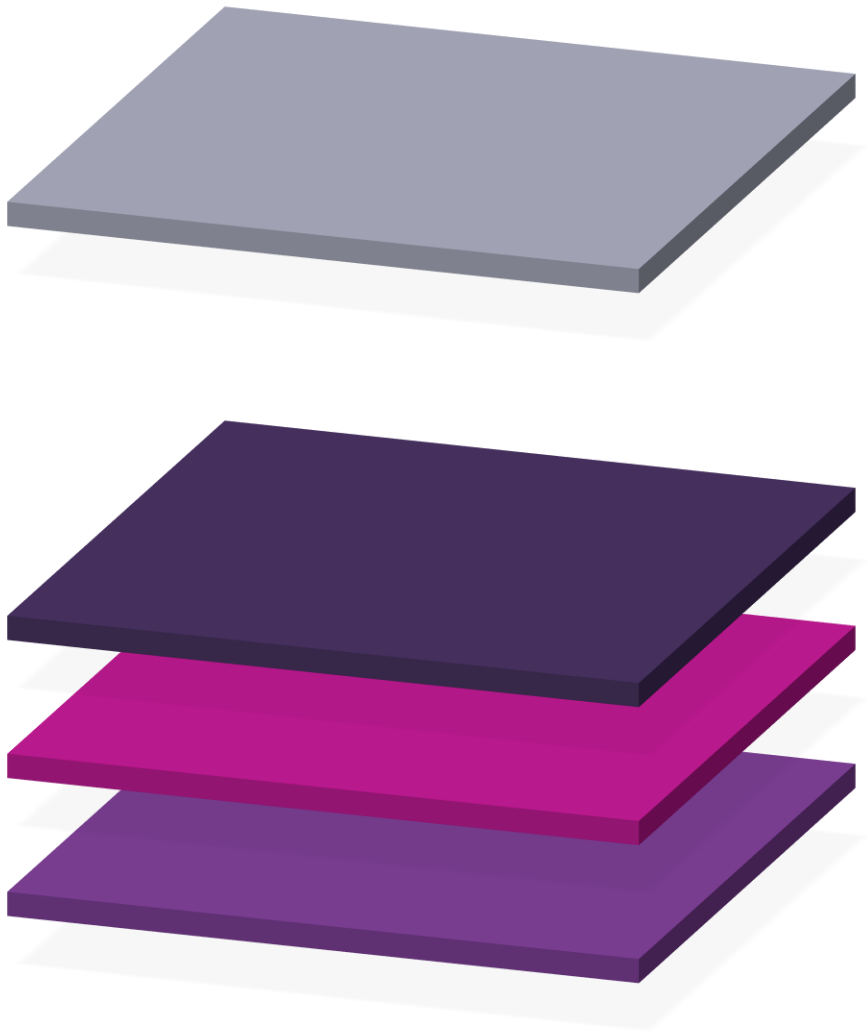
A layered approach

Domain Validation Certificate



Profile Requirements
TLS, Code Signing, S/MIME, etc.

Level of Assurance
Domain Validated (DV)

Network and Certificate System Security Requirements

Baseline Requirements (BR)

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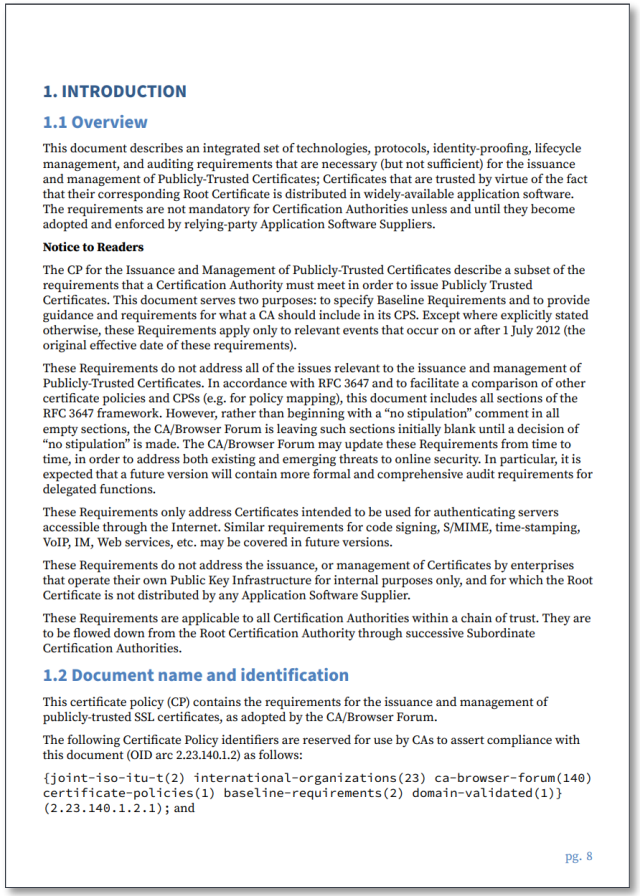
Transforming the RFC 3647 formatted documents



1. INTRODUCTION

1.1 Overview

This document describes an integrated set of technologies, protocols, identity-proofing, lifecycle management, and auditing requirements that are necessary (but not sufficient) for the issuance and management of Publicly-Trusted Certificates; Certificates that are trusted by virtue of the fact that their corresponding Root Certificate is distributed in widely-available application software. The requirements are not mandatory for Certification Authorities unless and until they become adopted and enforced by relying-party Application Software Suppliers.

Notice to Readers

The CP for the Issuance and Management of Publicly-Trusted Certificates describe a subset of the requirements that a Certification Authority must meet in order to issue Publicly Trusted Certificates. This document serves two purposes: to specify Baseline Requirements and to provide guidance and requirements for what a CA should include in its CPS. Except where explicitly stated otherwise, these Requirements apply only to relevant events that occur on or after 1 July 2012 (the original effective date of these requirements).

These Requirements do not address all of the issues relevant to the issuance and management of Publicly-Trusted Certificates. In accordance with RFC 3647 and to facilitate a comparison of other certificate policies and CPSs (e.g. for policy mapping), this document includes all sections of the RFC 3647 framework. However, rather than beginning with a "no stipulation" comment in all empty sections, the CA/Browser Forum is leaving such sections initially blank until a decision of "no stipulation" is made. The CA/Browser Forum may update these Requirements from time to time, in order to address both existing and emerging threats to online security. In particular, it is expected that a future version will contain more formal and comprehensive audit requirements for delegated functions.

These Requirements only address Certificates intended to be used for authenticating servers accessible through the Internet. Similar requirements for code signing, S/MIME, time-stamping, VoIP, IM, Web services, etc. may be covered in future versions.

These Requirements do not address the issuance, or management of Certificates by enterprises that operate their own Public Key Infrastructure for internal purposes only, and for which the Root Certificate is not distributed by any Application Software Supplier.

These Requirements are applicable to all Certification Authorities within a chain of trust. They are to be flowed down from the Root Certification Authority through successive Subordinate Certification Authorities.

1.2 Document name and identification

This certificate policy (CP) contains the requirements for the issuance and management of publicly-trusted SSL certificates, as adopted by the CA/Browser Forum.

The following Certificate Policy identifiers are reserved for use by CAs to assert compliance with this document (OID arc 2.23.140.1.2) as follows:

```
{joint-iso-itu-t(2) international-organizations(23) ca-browser-forum(140)
certificate-policies(1) baseline-requirements(2) domain-validated(1)}
(2.23.140.1.2.1); and
```

pg. 8

Chapter "1. INTRODUCTION" matches the root folder "001 INTRODUCTION"

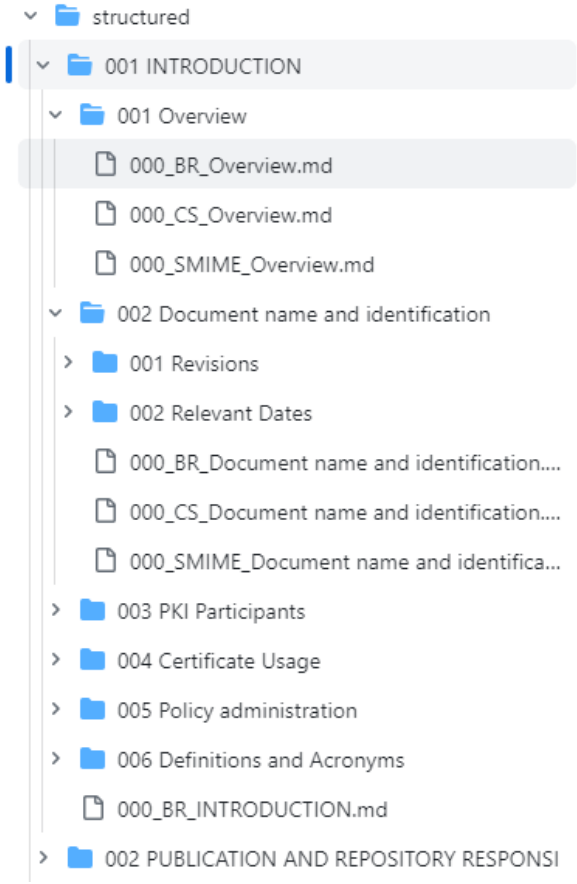
The subfolder "001 Overview" matches section "1.1 Overview"

The prefix of the folder or file relates back to the section of the document so the path:

"./001 ****/002 ***/015 ***"

Translates to section 1.2.15

The zero suffix ensures that files are shown and processed in the correct order.



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A small document contains one section

Preview | Code | Blame | 13 lines (8 loc) · 1.1 KB | Code 55% faster with GitHub Copilot | Raw

3.2.2.1 Identity

If the Subject Identity Information is to include the name or address of an organization, the CA SHALL verify the identity and address of the organization and that the address is the Applicant's address of existence or operation. The CA SHALL verify the identity and address of the Applicant using documentation provided by, or through communication with, at least one of the following:

1. A government agency in the jurisdiction of the Applicant's legal creation, existence, or recognition;
2. A third party database that is periodically updated and considered a Reliable Data Source;
3. A site visit by the CA or a third party who is acting as an agent for the CA; or
4. An Attestation Letter.

The CA MAY use the same documentation or communication described in 1 through 4 above to verify both the Applicant's identity and address.

Alternatively, the CA MAY verify the address of the Applicant (but not the identity of the Applicant) using a utility bill, bank statement, credit card statement, government-issued tax document, or other form of identification that the CA determines to be reliable.

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Why a structure with small documents?

A document per type (BR, TLS, DV, etc.)

- Migration is difficult and takes a long time
- Large documents can be hard to navigate
- It can be challenging to identify changes
- It’s easy to mess-up a large document
- Difficult to merge multiple layers into one document

A document per section

- Migration can be done section by section
  - Allows to automatically remove duplicate sections
- Easy to navigate a directory structure
- Easy to identify changes
- Focus on a single section when making updates, which should make it easier to draft ballots
- This enables a layered system where individual sections within a document can be appended or replaced
- Allows the creation of combined and separated documents

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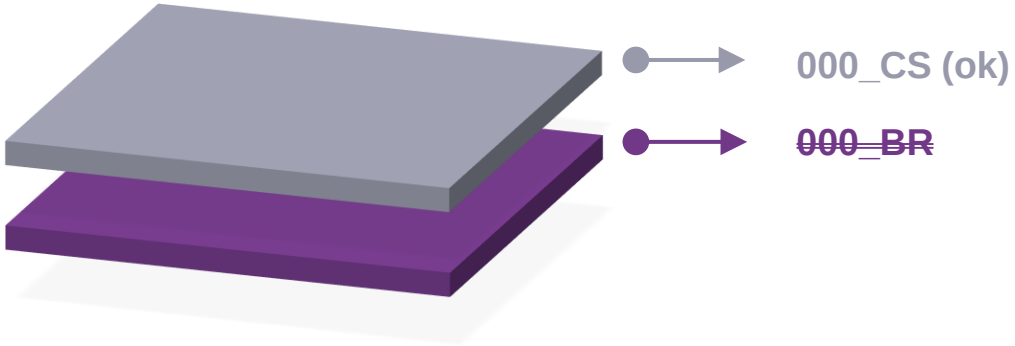
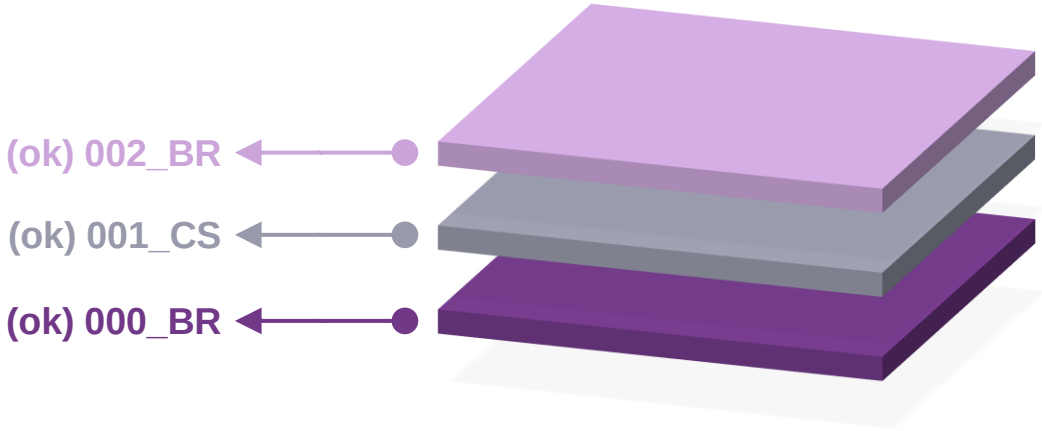
How are these layers created

The file name prefix defines the **weight** and **target** of the document, for example, a file starting with "000_" has the highest priority, this file normally starts a new section, but a file with a higher weight could contain conditional content.

Example: A file starting with "001_CS", will only be included if the target document defines the Code Signing requirements. In that case the file will be imported after "000_CS" or "000_BR" if no "000_CS" document exists.





- A file with the prefix 000_CS overrules a file with the prefix 000_BR
- When 000_CS does not exist, 000_BR will automatically be imported

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Identifying requirements

Currently the documents contain paragraphs that probably include one or more requirements, depending on the interpretation of the reader.

- In this POC we automatically identify requirements which are indicated using a simple format.
- The paragraph would provide the context to the requirement.

For example, if a document contains a text:

> “ [001] This is a requirement”

This will automatically be detected when building the document, appropriately numbered, and included in the final document and spreadsheet. The requirement number will be based on the location of the requirement, for example, if this requirement was included in section 1.1 of the BRs it would get numbered as “BR-1.1-001” and include the following row in the spreadsheet.

The spreadsheet helps with self-assessments and makes it easier to import and maintain a Governance Risk and Compliance (GRC) system with the corresponding controls.

ID	Section	LoA	Type	Requirement
BR-1.1-001	1.1		BR	This is a requirement

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Advanced instructions

- Frontmatter allows us to include or exclude a document from a certain target document, such as currently used in all the appendix documents.
  - It’s not sure if we also need this as the appendix document could simply be called TLS instead of BR in the current cases.
- Frontmatter is currently also used to set the LoA to DV, OV or EV, alternatively this could also be done using the filename.

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Status

- The generated BR document is equal to the source document, except for “No stipulation”, which are removed and some additional new lines.
  - New lines can be removed with automatic markdown formatting
  - "No stipulation“ is less predictable using layers and not consistently used, when do we want this?
  - CS and SMIME include some TLS specific sections which should be moved to TLS specific requirements and removed from the BR to ensure that they are not included in CS or SMIME requirements.
- Review the requirement matrix, do we need to add more information?
- Do we want to move LoA from frontmatter to the filename?
- Create a combined CSV file with all requirements for all document types.

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Playing with this Proof-of-Concept

- Check the README:

Usage

Transform documents:

```
py transform.py ../docs/BR.md
py transform.py ../docs/CS.md
py transform.py ../docs/SMIME.md
```

Remove duplicates:

```
py duplicates.py
```

Build documents and requirement sheets:

```
py build.py BR
py build.py CS
py build.py SMIME
```

Build documents and requirement sheets including only the following Level of Assurance (LoA):

```
py build.py BR --loa OV
py build.py BR --loa DV OV EV
```


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Thank You

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