Electronic Note (eNote) Specification

MISMO® V3 Tamper Evident SMART Doc® PDF

Issued by Fannie Mae and Freddie Mac
Version 1.2
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This communication relates to the Uniform Mortgage Data Program®, an effort undertaken jointly by Fannie Mae and Freddie Mac at the direction of their regulator, the Federal Housing Finance Agency.

Document Revisions	
Date	**Change**
01/23/2018	Modification to MIMETypeIdentifier value – Updated the sample code in sections 6i, 7e, and 10f. The new value is application/pdf, this value is also supported in the Closing Disclosure submission file (UCD)
04/25/2018	Corrected in section 10.c.ii XML example XML for RELATIONSHIP (missing colon characters in attributes) Changed Conditionality for DocumentFormIssuingEntityNumberIdentifier in Section 6.k Changed values in the XML sample of Section 5.5.f Corrected data point name AddressUnitDesignatorType in Section 5.1.h
11/15/2018	In Section 6, added explanation of the Usage column in the subsequent tables. In Section 6.b, corrected the placement of attribute IdentifierOwnerURI. Added a table describing the usage of all elements of the ABOUT_VERSION container. Added Section 8.e to provide guidance about additional text that may be needed on the Note. Added Section 10.f to provide guidance about signing with a Power of Attorney.

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1. Introduction

1.1 DOCUMENT PURPOSE AND SCOPE

This document provides a new and detailed specification for electronic Notes (eNotes) delivered to Fannie Mae and Freddie Mac (the GSEs). It covers the creation, data population, signing (both electronic and digital signatures), and packaging of eNotes utilizing the GSE Uniform Instruments. The specification is based on the *MISMO SMART Doc® PDF Implementation Guide* and is not intended to replace it, but rather to provide requirements specific to the GSE eNotes. This is the first update since the inception of their eMortgage programs to the original version 1.02 eNote specification mandated by the GSEs.

Although the specification does address some MERS® transaction types (e.g., MERS eRegistry registration and MERS® eDelivery), readers should consult MERS documentation for detailed requirements for submitting eMortgage transactions to MERS.

1.2 eMORTGAGES AND ENOTES

The term *eMortgage* refers to a mortgage loan where the closing documents–at a minimum, the Note– are created, accessed, presented, executed, transferred, and stored electronically. An eMortgage therefore includes an eNote, which is a Transferrable Record as defined by E-SIGN or UETA. Fannie Mae and Freddie Mac require registration on the MERS eRegistry for all eNotes delivered to the GSEs as the means to identify the Controller (holder) and Location (custodian) for the authoritative copy of the eNote.

1.3 WHAT IS A SMART DOC?

A SMART Doc is a self-contained electronic document that can bind together data, view(s), signature(s), and audit information and allows for long term archiving and retrieval. A SMART Doc uses the DOCUMENT XML structure defined by the MISMO Version 3.4 Reference Model schema. *SMART* is an acronym for Securable, Manageable, Archival, Retrievable, and Transferable.

Documents in electronic format provide the opportunity to augment what humans require – readable text – with another layer of information that computer systems can natively read with 100 percent accuracy, without use of any other technology such as Optical Character Recognition (OCR). The SMART Doc standard also provides the capability to create and update documents in electronic formats with information that cannot be natively added to a paper document – including audit trails, digital signatures (to confirm the document content has not been altered), and document classification information.

1.4 WHY ARE FANNIE MAE AND FREDDIE MAC CHANGING THE ENOTE FORMAT?

a. Eliminate barriers to adoption – In early 2016 under direction from our regulator (FHFA), the GSEs conducted extensive industry outreach to identify the barriers that are significant to the industry's transition to eMortgages and electronic closings (eClosings) and how the GSEs could address those barriers. The findings from that survey were published (see reference in 1.6.h). Feedback from technology solution providers (TSPs) indicated that the existing v1.02 eNote specification was outdated and overly complex and lacked sufficient guidance from the GSEs for implementation. This specification is intended to modernize the eNote format and provide greater clarity for implementers of the new standard.

b. Simplify – The existing v1.02 eNote specification was intended to be a 'verifiable' structure that included a mapping between Data and View to permit a consumer of the document to

verify that the data within the View was equivalent to the Data section used for automated processing. In evaluating industry feedback on the existing standard, a common theme wasthe need to simplify the specification to enable the industry to gain some traction with eMortgage. There were a few advocates for the GSEs to permit basic PDF eNotes, however, including XML data along with the presentation is a key requirement for the GSEs. This new specification utilizes the new 'Tamper- Evident' MISMO document profile. The GSEs will rely upon controls within the production process to ensure equivalence between the Data and View sections of the document. The GSEs may revisit the need for a truly 'verifiable' document format for eNotes at some point in the future.

c. PDF View vs XHTML – The existing v1.02 eNote specification includes a tagged View element that contains XHTML (eXtensible Hyper Text Markup Language). The remainder of the closing document set typically uses the PDF format. Although this XHTML View format provides for more consistent rendering of the document on different devices, the XHTML creates significant additional complexity for many eClosing platform solution providers looking to implement and support electronic execution of a complete closing document set. The desire for the GSEs to move to a format that included a PDF-based View was clearly communicated through our industry outreach efforts.

d. Bring the XML structure up to current MISMO architecture

   i. XSD rather than DTD: The current version of the eMortgage Specification is based on MISMO Version 1.02. This was an early, transaction-based version of MISMO that used a Document Type Definition (DTD) structure that was present in the earlier 1.x and 2.x versions of MISMO. In recent years, MISMO created the Version 3 standard in XML Schema Definition (XSD). This was made to consistently represent data and groupings of data that were used across business functions like loan delivery or servicer reporting. The older DTDs have limitations to validation that the XSD does not. The updates to this eMortgage Specification are based on the MISMO Version 3.4 Reference Data Model.

   ii. Shared MISMO Version 3.x Reference Model: Rather than using the transaction-specific MISMO published Credit Request and Response formats, Mortgage Insurance Application transaction formats and dozens of other formats based on the older DTDs, the new specification is based on the shared MISMO v3.x reference model. The shared MISMO v3.x Reference Model has the following advantages:

      - Common Reference Model Interoperability
        - ✓ Puts data in a single context making it easier to use.
        - ✓ Allows trading partners to work with the same structure for representing data and documents.
        - ✓ Bridges the gaps between the functions that make up the life cycle of a loan.

      - Extensibility
        - ✓ Implementations can add functionality over time, without losing compatibility.

      - Reusability
        - ✓ Implementers working in several areas will be able to reuse development artifacts.
        - ✓ Ability to leverage third-party document tools.

Consistent with other datasets used by the GSEs in the loan manufacturing process

(e.g., the Uniform Closing Dataset (UCD)). The eMortgage Specification update is based on MISMO v3.4. The UCD Specification is based on MISMO v3.3. Both versions have similar structures that will ultimately facilitate using the data components (i.e., containers, data points, and enumerations).

1.5 SUPPORTING DOCUMENTS

a. MISMO Version 3 SMART Doc PDF Implementation Guide: This provides the guidelines and requirements for creating MISMO SMART Docs that use the MISMO DOCUMENT structure in conjunction with the PDF/A-3 standard [PDF/A-3]. This implementation guidance allows implementers to create SMART Docs with standardized structures that are interoperable in the context of complex business workflows. The guide is available at www.mismo.org/standards- and-resources/implementation-guides.

b. MISMO Digital Signature Implementation Guide: This provides the guidelines and requirements for use of XML digital signatures for creating tamper-evident electronic seals around documents that employ the MISMO standard. It includes how to enable tamper-evident seals to be used in conjunction with stakeholder, witness, and notary signatures and also includes interoperability in the context of complex mortgage business workflows. The guide is available at www.mismo.org/standards-and-resources/implementation-guides.

c. MISMO eMortgage Glossary: A glossary of terms used in the eMortgage specification, implementation guides, and other eMortgage related documentation. The glossary is available at www.mismo.org/Documents/MISMO/Documents/eMortgageGlossary_09212016.docx.

d. MISMO v. 3.4.0 Logical Data Dictionary (LDD): This provides a business-centric view of the MISMO Reference Model. The LDD provides standard business names, definitions, enumerations, and more in an easy-to -use format. It is available at www.mismo.org/standards- and-resources/residential-specifications.

e. SMART Doc v3 eNote Data Mapping: This document provides a detailed mapping of all the data used for the eNote to the MISMO data structures and the fields of the Uniform Instruments maintained by the GSEs.

   Fannie Mae: https://www.fanniemae.com/content/news/enote-specification
   Freddie Mac: http://www.freddiemac.com/singlefamily/sell/e_notespecification.html

f. eNote Samples: Representative examples of all the categories of eNotes in the PopulatedDocument state, as well as examples of signed and tamper-sealed eNotes.

   Freddie Mac:http://www.freddiemac.com/singlefamily/sell/e_notespecification.html
   Fannie Mae: https://www.fanniemae.com/content/news/enote-specification

g. MERS eRegistry Documentation

h. eMortgages: Joint GSE eMortgage Outreach Survey Findings on the State of Industry Adoption

i. eMortgage Documentation from the GSEs

i. Fannie Mae
   1. Fannie Mae eMortgage webpage
   2. Guide to Delivering eMortgage Loans to Fannie Mae
   3. eMortgage Technology Solution Provider List

ii. Freddie Mac
   1. Freddie Mac eMortgage webpage
   2. Freddie Mac eMortgage Guide
   3. Freddie Mac Approved eMortgage Vendors List

2. The eNote Creation Process

The SMART Doc eNote will go through various stages during the creation process. These stages may all be performed by a single solution provider or the process may involve handoffs among multiple providers to reach completion. These process steps are summarized below and detailed later in this specification.

a. Creating the unpopulated document – The GSEs have published unpopulated document templates for each of the Uniform Note Instruments. Additional text and data fields that are specific to eNotes must be included to produce the corresponding eNote Instruments. In this document, Section 8: Uniform Instruments provides detailed instructions for incorporating this content. Document providers are expected to use or conform to these requirements for generating eNotes to be sold to the GSEs.

b. Populating the document – This step involves populating the PDF view document with loan and related data, and populating the 'Deal Sets' portion of the document with the same data. Additionally, the 'Audit Log' section of the document is updated to reflect population of the document. See Section 9: Creating the Populated Document, for further information.

c. Signing the document – Borrower signatures are applied to the populated PDF View. These signatures MAY be either text, image, or digital signatures. For each signature applied to the document, a corresponding Signatory element and Audit Trail entry MUST be included in the XML document. See Section 10: Signing for further information.

d. Tamper-sealing the document – Once the final signature has been applied to the PDF and the PDF has been encoded and embedded into the eNote, an XML Digital Signature is applied to the entire document to create a tamper-evident seal, using the System Signature element of the document model. See Section 11: Applying the Tamper Seal for further information.

e. MERS Registration – The final step in the creation process is registration of the eNote with the MERS eRegistry. The GSEs currently require the 'Presentation' method of registration for the existing v1.02 eNote. However, because this registration method is currently limited to v1.02 eNotes, registration of MISMO V3 eNotes, as detailed in this specification, will require use of the alternative 'Data Point' registration method. See Section 12: Registration for further information.

3. Required Document States and Audit Trail Entries

The Audit Trail section of the document is used to log actions performed on the document during the creation process and the person or system that performed those actions. At a minimum, the AUDIT_TRAIL container must contain AUDIT_TRAIL_ENTRIES for the following Event Types:

- PopulatedDocument – The document template has been populated with borrower and loan data.
- SignedDocument – A principal party has signed the document. An entry is required for each signature applied to the document.

- AppliedFinalTamperEvidentSignature – The final tamper-evident digital signature has been applied to the fully executed document.

Each AUDIT_TRAIL_ENTRY MUST include the following:

- EventType
- PerformedByOrganizationName
- EntryDatetime

4. The MISMO V3 Document Structure – Overview

As described in the *MISMO Version 3 SMART Doc PDF Implementation Guide*, certain XML elements are needed to create a SMART Doc. For the eNote, which conforms to the Tamper Evident document profile, the following components are used:

a. About Version, which identifies the SMART Doc Profile, is required.

b. Audit Trail logs for events that occur during the lifecycle of the document are required.

c. Deal Sets that provide the business data for the document are required.

d. Document Classifications that describes the type, purpose, and use of the document, including the document name, are Required.

e. Relationships that provide associations between the different document elements are Required for the eNote, although they are Optional in the Tamper Evident document profile.

f. Signatories, which provide data about executed document signatures, are Required for the eNote, although they are Conditional in the Tamper Evident document profile.

g. System Signature, which provides a digital signature over some or all the document to provide proof that no tampering has occurred, is Required.

h. Templates or mappings that relate data from other sections of the document to the viewable image are PROHIBITED in the Tamper Evident document profile.

i. View provides the visual representation of the document and is Required.

5. Business Data Structures

The eNotes contain multiple sections that provide the legal text of the instrument. The legal text includes blank spaces designated to show the value corresponding to the information described in the text, for example, the property address, monthly payment, etc. These values are stored as data points in the eNote XML submission file and documented in the *SMART Doc v3 eNote Data Mapping*. Please refer to the Master Map tab of the *SMART Doc v3 eNote Data Mapping* for the general list of data points or to the corresponding Instrument Mapping tab to determine which data element is placed into a given form field in the PDF view.

There are 14 tabs in the *SMART Doc v3 eNote Data Mapping* with data points for all the eNotes recognized by the GSEs. Data points can be identified by the Form ID displayed as a number in the eNote and in the corresponding column of the *SMART Doc v3 eNote Data Mapping*.

5.1 HEADER

The first header line provides the date and place where the Note was executed. It is represented in MISMO standard using the following data elements found in the TERMS_OF_LOAN element:

a. NoteDate – The date on the Note must be provided and cannot be blank.

b. NoteCityName – This is the name of the city where the Note was executed. This must be provided and cannot be blank.

c. NoteStateName – This is the name of the state where the Note was executed. This must be provided and cannot be blank.

For the property address, use the following data elements that are found in the ADDRESS element of the MISMO standard:

d. CityName – The name of the city must be provided and cannot be blank. e. StateCode – The two-character representation of the US state.

f. AddressLineText – The street address with the address number, pre-directional, street name, post- directional, address unit designator and address unit value. Must be provided and cannot be blank.

g. AddressUnitIdentifier – The identifier value associated with the Secondary Address Unit Designator.

Example: 123, C, B1C, etc. If it exists, it must be provided.

h. AddressUnitDesignatorType – A value from a MISMO prescribed list that specifies a further level of detail for a street address, for example, Suite or Unit. This list is based on the USPS Publication 28 on Postal Addressing Standards with the addition of Condo based on mortgage industry need. If it exists it must be provided.

In the XML file, the date format MUST be CCYY-MM-DD (e.g., 2017-05-15) to comply with the MISMO standard; in the PDF View, the month should be written out, and the date shown as, for example, May 15, 2017.

```
<DEAL_SETS>
  <DEAL_SET>
    <DEALS>
      <DEAL>
        <COLLATERALS>
          <COLLATERAL>
            <SUBJECT_PROPERTY>
              <ADDRESS>
                <AddressLineText>123 Main Street</AddressLineText>
                <AddressUnitDesignatorType>Apartment</AddressUnitDesignatorType>
                <AddressUnitIdentifier>101</AddressUnitIdentifier>
                <CityName>Hometown</CityName>
                <PostalCode>63101</PostalCode>
                <StateCode>MO</StateCode>
              </ADDRESS>
            </SUBJECT_PROPERTY>
          </COLLATERAL>
        </COLLATERALS>
        <LOANS>
          <LOAN>
            <TERMS_OF_LOAN>
              <NoteAmount>250000</NoteAmount>
              <NoteCityName>Hometown</NoteCityName>
              <NoteDate>2017-03-18</NoteDate>
              <NoteRatePercent>4.2500</NoteRatePercent>
              <NoteStateName>Missouri</NoteStateName>
            </TERMS_OF_LOAN>
          </LOAN>
```

5.2 BORROWER'S PROMISE TO PAY

a. NoteAmount – The amount to be repaid as disclosed on the Note. This amount cannot be blank or null, must be greater than 0 dollars and less than 999,999,999.99, with two decimals.

b. PartyRoleType – This data point was not supported in MISMO Version 1.02. It is used to describe the role played by the party referenced and can be either an individual or legal entity. In this context (BORROWER'S PROMISE TO PAY) the value is Lender (legal entity). Must be provided and cannot be blank.

c. FullName – The unparsed name of the lender. It must be provided.

```
            <TERMS_OF_LOAN>
              <NoteAmount>250000</NoteAmount>
            </TERMS_OF_LOAN>
          </LOAN>
        </LOANS>
        <PARTIES>
          <PARTY SequenceNumber="3" xlink:label="PARTY3">
            <LEGAL_ENTITY>
              <LEGAL_ENTITY_DETAIL>
                <FullName>Bailey Building and Loan</FullName>
              </LEGAL_ENTITY_DETAIL>
            </LEGAL_ENTITY>
            <ROLES>
              <ROLE SequenceNumber="2" xlink:label="PARTY3_ROLE2">
                <ROLE_DETAIL>
                  <PartyRoleType>Lender</PartyRoleType>
                </ROLE_DETAIL>
              </ROLE>
```

5.3 INTEREST

a. NoteRatePercent – The actual interest rate as disclosed on the Note. Must be provided and cannot be blank.

```
<TERMS_OF_LOAN>
  <NoteDate>2017-03-18</NoteDate>
  <NoteRatePercent>4.2500</NoteRatePercent>
</TERMS_OF_LOAN>
```

5.4 PAYMENTS

a. PaymentRemittanceDay – The day of the month on which the loan payment is to be remitted under the terms of the Mortgage. For instruments where it is required, it must be provided and cannot be blank, should be a value greater than 0 and less or equal than 31.

> Only used in the Standard Fixed Rate, Standard Fixed Rate (WV), and Standard Growing Equity notes

b. ScheduledFirstPaymentDate – The date of the first scheduled mortgage payment to be made by the borrower under the terms of the mortgage.

c. LoanMaturityDate – The date when the loan is scheduled to be paid in full as reflected on the Note. The date must be provided and cannot be blank.

d. PartyRoleType – This data point was not supported in MISMO Version 1.02. It is used to describe the role played by the party referenced, and it could be for a person or a legal entity. In this context (PAYMENTS) the value is NotePayTo. Must be provided and cannot be blank.

e. AddressLineText – The street address where payments should be remitted, with the address number, pre-directional, street name, post-directional, address unit designators and address unit value. Must be provided and cannot be blank.

f. AddressUnitIdentifier – The identifier value associated with the Secondary Address Unit Designator. Example: 123, C, B1C, etc. If it exists, it must be provided.

g. AddressUnitDesignatorType – A value from a MISMO prescribed list that specifies a further level of detail for a street address, for example, Suite or Unit. This list is based on the USPS Publication 28 on Postal Addressing Standards with the addition of Condo based on mortgage industry need. If it exists it must be provided.

h. CityName – The name of the city must be provided and cannot be blank.

i. StateCode – The two-character representation of the US state, US Territory, Canadian Province, Military APO FPO, or Territory. Must be provided in the form of 2 character state code and cannot be blank.

j. PostalCode – The postal code (ZIP Code in the US) for the address. ZIP Code may be either 5 or 9 digits. Must be provided and cannot be blank.

```
<LOANS>
  <LOAN>
    <MATURITY>
      <MATURITY_RULE>
        <LoanMaturityDate>2047-03-01</LoanMaturityDate>
      </MATURITY_RULE>
    </MATURITY>
    <PAYMENT>
      <PAYMENT_RULE>
        <PaymentRemittanceDay>---01</PaymentRemittanceDay>
        <ScheduledFirstPaymentDate>2017-04-01</ScheduledFirstPaymentDate>
      </PAYMENT_RULE>
    </PAYMENT>
  </LOAN>
</LOANS>
<PARTIES>
  <PARTY SequenceNumber="3" xlink:label="PARTY3">
    <LEGAL_ENTITY>
      <LEGAL_ENTITY_DETAIL>
        <FullName>Bailey Building and Loan</FullName>
      </LEGAL_ENTITY_DETAIL>
    </LEGAL_ENTITY>
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      <ADDRESS>
        <AddressLineText>507 Main Street</AddressLineText>
        <AddressUnitDesignatorType>Suite</AddressUnitDesignatorType>
        <AddressUnitIdentifier>201</AddressUnitIdentifier>
        <CityName>Milltown</CityName>
        <PostalCode>50102</PostalCode>
        <StateCode>IA</StateCode>
      </ADDRESS>
    </ADDRESSES>
    <ROLES>
      <ROLE SequenceNumber="1" xlink:label="PARTY3_ROLE1">
        <ROLE_DETAIL>
          <PartyRoleType>NotePayTo</PartyRoleType>
        </ROLE_DETAIL>
      </ROLE>
```

5.5 MONTHLY PAYMENT(S) CALCULATIONS

a. FirstPrincipalAndInterestPaymentChangeMonthsCount - The number of months after origination in which the first payment adjustment occurs. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Standard Growing Equity Notes

b. InitialPrincipalAndInterestPaymentAmount – The dollar amount of the principal and interest payment as stated on the Note. The principal and interest payment is usually obtained using the loan amount and interest rate to arrive at full amortization during the loan term. Must be provided and cannot be blank.

c. FirstPrincipalandInterestPaymentChangeDate – The date on which the first payment adjustment occurs. Must be provided and cannot be blank.

Only used in the Standard Growing Equity Notes

d. FirstRateChangePaymentEffectiveDate – The due date of the first payment reflecting the first interest adjustment change for the loan. For instruments where it is required, it must be provided and cannot be blank.

> Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable- Rate Notes with Subsequent Caps No Conversion

e. GPMMultiplierRatePercent – The percent used to calculate the new monthly Graduated Payment Amount.

   i. In the XML data, this is expressed as a percentage, with a value greater than 100.00 and less than 109.99.

   ii. On the PDF View, this needs to be transformed from a percentage to a factor by dividing by 100. This will yield a value greater than 1.0000 and less than 1.0999.

> Only used in the Standard Growing Equity Notes

f. GEMPayoffYearsCount – The number of years in which a Growing Equity Mortgage (GEM) is calculated to be fully repaid using the original payment amount. Greater than 1 and less than 50.

> Only used in the Standard Growing Equity Notes

```
LOANS>
 <LOAN>
   <ADJUSTMENT>
     <PRINCIPAL_AND_INTEREST_PAYMENT_ADJUSTMENT>
       <PRINCIPAL_AND_INTEREST_PAYMENT_LIFETIME_ADJUSTMENT_RULE>
         <FinalPrincipalAndInterestPaymentChangeDate>2020-04-01</FinalPrincipalAndInterestPaymentChangeDate>
         <FirstPrincipalAndInterestPaymentChangeMonthsCount>36</FirstPrincipalAndInterestPaymentChangeMonthsCount>
         <GEMPayoffYearsCount>30</GEMPayoffYearsCount>
         <GPMMultiplierRatePercent>102.00</GPMMultiplierRatePercent>
       </PRINCIPAL_AND_INTEREST_PAYMENT_LIFETIME_ADJUSTMENT_RULE>
     </PRINCIPAL_AND_INTEREST_PAYMENT_ADJUSTMENT>
   </ADJUSTMENT>
   <PAYMENT>
     <PAYMENT_RULE>
       <InitialPrincipalAndInterestPaymentAmount>1220.00</InitialPrincipalAndInterestPaymentAmount>
       <PaymentRemittanceDay>---01</PaymentRemittanceDay>
       <ScheduledFirstPaymentDate>2017-04-01</ScheduledFirstPaymentDate>
     </PAYMENT_RULE>
   </PAYMENT>
```

5.6 INTEREST RATE AND MONTHLY PAYMENT CHANGES

a. PerChangeRateAdjustmentFrequencyMonthsCount – The number of months between rate adjustments, if the interest rate on the subject loan can change. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Multistate Adjustable-Rate Note - COF Index and Multistate Adjustable-Rate Note - COF Index with Conversion

b. MarginRatePercent – The number of percentage points to be added to the index to arrive at the new interest rate. Greater than 0 and less than 20.

Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

c. AdjustmentRuleType – Specifies whether the occurrence of the adjustment is the first change or a subsequent change. In this instance the enumerations will be “First”. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

d. PerChangeCeilingRatePercent – The stated maximum, expressed as a percent, to which the interest rate can increase to in this adjustment period. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

e. PerChangeFloorRatePercent – The stated minimum, expressed as a percent, to which the interest rate can decrease to in this adjustment period. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

f. PerChangeMaximumDecreaseRatePercent – The maximum number of percentage points by which the rate can decrease from the previous interest rate. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

g. PerChangeMaximumIncreaseRatePercent – The maximum number of percentage points by which the rate can increase from the previous interest rate. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

h. CeilingRatePercent – The stated maximum percentage to which the interest rate can increase over the life of the loan. For instruments where it is required, it must be provided and cannot be blank

Only used in the Standard Fixed/Adjustable Rate Notes, Standard Fixed/Adjustable Rate Notes with Conversion, Standard Adjustable-Rate Notes, Standard Adjustable-Rate Notes (WV), Multistate Adjustable-Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, Multistate Adjustable-Rate Note - COF Index, Multistate Adjustable-Rate Note - COF Index with Conversion, and Multistate Adjustable-Rate Notes with Subsequent Caps No Conversion

```
<LOANS>
  <LOAN>
    <ADJUSTMENT>
      <INTEREST_RATE_ADJUSTMENT>
        <INTEREST_RATE_LIFETIME_ADJUSTMENT_RULE>
          <CeilingRatePercent>10.2500</CeilingRatePercent>
          <MarginRatePercent>0.75</MarginRatePercent>
        </INTEREST_RATE_LIFETIME_ADJUSTMENT_RULE>
        <INTEREST_RATE_PER_CHANGE_ADJUSTMENT_RULES>
          <INTEREST_RATE_PER_CHANGE_ADJUSTMENT_RULE>
            <AdjustmentRuleType>First</AdjustmentRuleType>
            <PerChangeCeilingRatePercent>6.2500</PerChangeCeilingRatePercent>
            <PerChangeFloorRatePercent>3</PerChangeFloorRatePercent>
            <PerChangeMaximumDecreaseRatePercent>1.2500</PerChangeMaximumDecreaseRatePercent>
            <PerChangeMaximumIncreaseRatePercent>2.000</PerChangeMaximumIncreaseRatePercent>
          </INTEREST_RATE_PER_CHANGE_ADJUSTMENT_RULE>
        </INTEREST_RATE_PER_CHANGE_ADJUSTMENT_RULES>
      </INTEREST_RATE_ADJUSTMENT>
    </ADJUSTMENT>
```

5.7 FIXED INTEREST RATE CONVERSION OPTION

a. ConversionOptionPeriodAdjustmentEffectiveDate – The payment due date when the convertible factors become applicable, also known as the conversion period start date. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Multistate Adjustable-Rate Note - COF Index with Conversion

b. ConversionOptionPeriodExpirationDate – The payment due date when the convertible factors expire. For instruments where it is required, it must be provided and cannot be blank.

Only used in the Multistate Adjustable-Rate Note - COF Index with Conversion

c. ConversionOptionPeriodFeeAmount – The dollar amount that the mortgagor must pay to exercise the conversion option. For instruments where it is required, it must be provided and cannot be blank. Greater than 0 and less than 999,999,999.99. If decimal point is present, then precision must be 2 places.

Only used in the Standard Fixed/Adjustable Rate Notes with Conversion, Multistate Adjustable-Rate Notes with Conversion. Multistate Adjustable-Rate Notes with Conversion and Subsequent Caps, and Multistate Adjustable-Rate Note - COF Index with Conversion

```
<LOANS>
  <LOAN>
    <ADJUSTMENT>
      <CONVERSION_ADJUSTMENT>
        <CONVERSION_OPTION_PERIOD_ADJUSTMENT_RULES>
          <CONVERSION_OPTION_PERIOD_ADJUSTMENT_RULE>
            <ConversionOptionPeriodAdjustmentEffectiveDate>2018-04-01</ConversionOptionPeriodAdjustmentEffectiveDate>
            <ConversionOptionPeriodExpirationDate>2027-04-01</ConversionOptionPeriodExpirationDate>
            <ConversionOptionPeriodFeeAmount>500.00</ConversionOptionPeriodFeeAmount>
          </CONVERSION_OPTION_PERIOD_ADJUSTMENT_RULE>
        </CONVERSION_OPTION_PERIOD_ADJUSTMENT_RULES>
      </CONVERSION_ADJUSTMENT>
    </ADJUSTMENT>
```

5.8 BORROWER'S FAILURE TO PAY AS REQUIRED

a. LateChargeGracePeriodDaysCount – The grace period in days for this loan before a late charge will be applied. Must be provided and cannot be blank. Greater than 0 and less than 365.

b. LateChargeRatePercent – The percentage that a borrower is required to pay for failure to make a regular installment within the period specified on the note. Must be provided and cannot be blank.
Greater than 0 and less than 99.999. *Note: The Fannie Mae and Freddie Mac Seller and Servicer Guides provide the acceptable ranges for the LateChargeRatePercent for loans delivered to the GSEs.*

c. LateChargeMaximumAmount – The maximum monthly late charge amount allowed. For instruments where it is required, it must be provided and cannot be blank. Greater than 0 and less than 999,999,999.99. If decimal point is present, then precision must be 2 places.

Only used in the Standard Fixed Rate Note (WV) and Standard Adjustable-Rate Notes (WV)

```
<LOANS>
  <LOAN>
    <LATE_CHARGE>
      <LATE_CHARGE_RULE>
        <LateChargeGracePeriodDaysCount>15</LateChargeGracePeriodDaysCount>
        <LateChargeMaximumAmount>61.00</LateChargeMaximumAmount>
        <LateChargeRatePercent>5.0000</LateChargeRatePercent>
      </LATE_CHARGE_RULE>
    </LATE  CHARGE>
```

5.9 WITNESS THE HAND(S) AND SEAL(S) OF THE UNDERSIGNED.

5.9.1. Borrower:

a. PartyRoleType – This data point was not supported in MISMO Version 1.02; it is used to describe the role played by the referenced party, who could be either a person or a legal entity. In this context, the value is Borrower. This MUST be provided and cannot be blank.

b. FirstName – The first name of the individual Borrower. Must be provided and cannot be blank.

c. MiddleName – The middle name of the individual Borrower. If it exists it must be provided.

d. LastName – The last name of the individual Borrower. Must be provided and cannot be blank.

e. SuffixName – The name suffix of the individual Borrower. If it exists it must be provided.

f. If the Borrower is a Legal Entity, rather than an Individual (for example, a Trust), see Section 4.8.3 of the *MISMO SMART Doc PDF Implementation Guide*, which provides instructions for Linking Signatures of Legal Entities.

5.10 BELOW THE BORROWER(S) SIGNATURES

5.10.1. Loan Originator:

a. PartyRoleType – this data point was not supported in MISMO version 1.02, it is used to describe the role played by the party referenced, could be a person or legal entity. In this context, the value is LoanOriginator, LoanOriginationCompany, or MortgageBroker. Must be provided and cannot be blank.

b. FirstName – The first name of the individual represented by the parent object. Must be provided and cannot be blank.

c. MiddleName – The middle name of the individual represented by the parent object. If it exists it must be provided.

d. MiddleName – The middle name of the individual represented by the parent object. If it exists it must be provided.

e. SuffixName – The name suffix of the individual represented by the parent object. If it exists it must be provided.

f. For legal entities, use the FullName data point in the LEGAL_ENTITY_DETAIL container element.

5.10.2. NMLS:

a. LicenseIssuingAuthorityName – The name of the issuing authority through which the party obtained the license. In this context, the value is NMLS. Must be provided and cannot be blank.

b. LicenseIdentifier – The identifier of the license or certificate issued to the party. The attribute IdentifierOwnerURI identifies the issuer of the license or certificate.

5.10.3. Private:

a. LicenseAuthorityLevelType – - Level of authority of the license issuer. In this context, the value is Private. Must be provided and cannot be blank.

b. LicenseIdentifier – The identifier of the license or certificate issued to the party. The attribute IdentifierOwnerURI identifies the issuer of the license or certificate.

5.10.4. Public State:

a. LicenseAuthorityLevelType – Level of authority of the license issuer. In this context, the value is PublicState. Must be provided and cannot be blank.

b. LicenseIdentifier – The identifier of the license or certificate issued to the party. The attribute IdentifierOwnerURI identifies the issuer of the license or certificate.

```
<PARTY SequenceNumber="1" xlink:label="PARTY1_ROLE1">
  <INDIVIDUAL>
    <NAME>
      <FirstName>Harry</FirstName>
      <LastName>Homeowner</LastName>
      <MiddleName>Michael</MiddleName>
      <SuffixName>Jr</SuffixName>
    </NAME>
  </INDIVIDUAL>
  <ROLES>
    <ROLE xlink:label="PARTY1_ROLE1">
      <ROLE_DETAIL>
        <PartyRoleType>Borrower</PartyRoleType>
      </ROLE_DETAIL>
    </ROLE>
  </ROLES>
</PARTY>
  <PARTY SequenceNumber="2" xlink:label="PARTY2">
  <INDIVIDUAL>
    <NAME>
      <FullName>George Bailey</FullName>
    </NAME>
  </INDIVIDUAL>
  <ROLES>
    <ROLE SequenceNumber="1" xlink:label="PARTY2_ROLE1">
      <LICENSES>
        <LICENSE>
          <LICENSE_DETAIL>
            <LicenseIdentifier>123456</LicenseIdentifier>
            <LicenseIssueDate>2013-02-01</LicenseIssueDate>
            <LicenseIssuingAuthorityName>NMLS</LicenseIssuingAuthorityName>
          </LICENSE_DETAIL>
        </LICENSE>
      </LICENSES>
      <ROLE_DETAIL>
        <PartyRoleType>LoanOriginator</PartyRoleType>
      </ROLE_DETAIL>
    </ROLE>
  </ROLES>
</PARTY>
```

6. Technical Data Structures

In the previous section, we discussed the data points used to support the business text in the eNote. There are other data points that are not visible in the eNote View but are required in the XML submission file. This section discusses these data points and builds on material contained in the *MISMO SMART Doc PDF Implementation Guide*. There are a number of tables below in this section that provide details about the data elements for each container element. In these tables, the "Usage" column tells whether a data element is Required (it MUST be present and correctly populated in order to have a valid eNote), Conditional (it must be present under certain conditions that are specified in the Notes column), Optional (it MAY be populated at the discretion of the the document creator to support system or business functionality, tracking, or other purposes), or Prohibited (it MUST NOT be present in order to have a valid eNote).

The following data points and containers are organized based on the hierarchical order of the MISMO Schema:

a. DOCUMENT

i. Required Components of DOCUMENT – covered in the following Sections e – q.

ii. Document components that are NOTt used in the Version 3 eNote:

1. MAP – Not used for the Tamper Evident profile.
2. REFERENCE – external references are prohibited.
3. UNKNOWN_VERSION3_DOCUMENT – not relevant to eNote.

iii. Attribute: MISMOReferenceModelIdentifier

<DOCUMENT MISMOReferenceModelIdentifier ="3.4.032420160128"> …
</DOCUMENT>

iv. Sample:

<DOCUMENT
xmlns="http://www.mismo.org/residential/2009/schemas"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
MISMOReferenceModelIdentifier="3.4.0.3240160128"
schemaLocation="http://www.mismo.org/residential/2009/schemas
MISMO_3.4.0_B324.xsd http://www.w3.org/2000/09/xmldsig#
xmldsig-core- schema.xsd">

b. DOCUMENT /ABOUT_VERSIONS/ABOUT_VERSION

The ABOUT_VERSION container is intended to provide system-related version Information. For SMART Docs, it is used to identify the document profile. For the eNote, in the AboutVersionIdentifier, the value MUST be specified as TamperEvident. Its attribute IdentifierOwnerURI MUST be populated with the value "http://www.mismo.org/residential/2009/SMARTDocProfile", in compliance with the SMART Doc Implementation Guide.

Node Name	Usage	Notes
DOCUMENT ABOUT_VERSIONS/ABOUT_VERSION/AboutVersionIdentifier	Required	This element must be present, and the value must be TamperEvident.
DOCUMENT ABOUT_VERSIONS/ABOUT_V	Required	This attribute belongs to element AboutVersionIdentifier. Its value must

ERSION/AboutVersionIdentifier @ IdentifierOwnerURI		be ""http://www.mismo.org/residential/2009/SMARTDocProfile"
DOCUMENT ABOUT_VERSIONS/ABOUT_VERSION/CreatedDatetime	Optional	This element is optional. The suggested purpose of CreatedDatetime is to communicate when the document was created or last updated.
DOCUMENT ABOUT_VERSIONS/ABOUT_VERSION/DataVersionIdentifier	Optional	This element is optional. It could be used by the creator to identify the version of the data file or record from which the document was populated.
DOCUMENT ABOUT_VERSIONS/ABOUT_VERSION/DataVersionName	Optional	This element is optional. It could be used by the creator to identify or describe the data file or record from which the document was populated.

Here is an example:

```
<ABOUT_VERSIONS>
 <ABOUT_VERSION>
  <AboutVersionIdentifier IdentifierOwnerURI=
   "http//www.mismo.org/residential/2009/SMARTDocProfile">
      TamperEvident
  </AboutVersionIdentifier>
  <CreatedDatetime>2017-03-18T09:30:47Z</CreatedDatetime>
 </ABOUT_VERSION>
</ABOUT_VERSIONS>
```

c. AUDIT_TRAIL/AUDIT_TRAIL_ENTRIES/AUDIT_TRAIL_ENTRY/AUDIT_TRAIL_ENTRY_DETAIL

The AUDIT_TRAIL container provides information about the state transitions of a document. A SMART Doc MUST contain one AUDIT_TRAIL_ENTRY element to describe each SYSTEM_SIGNATURE element that is present in the SYSTEM_SIGNATURES container. Additional AUDIT_TRAIL_ENTRY elements MAY be provided to describe other state transitions of the document. The AUDIT_TRAIL_ENTRY element MUST comply with the requirements stated in the table below.

Node Name	Usage	Notes
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/EventType	Required	The event to which the named organization is attesting. The value of the EventType will differ based on the document state and event processing. Required Event Types for the eNote: PopulatedDocument, SignedDocument, AppliedFinalTamperEvidentSignature. If interim tamper seals are applied, use the Event Type: AppliedTamperEvidentSignature.
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/EventTypeOtherDescription	Conditional	If the value of EventType is “Other”, then this element is required; otherwise, it is prohibited.
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/PerformedByOrganizationName	Required	The name of the organization that executed the event transaction. This element is specified as Optional in the SMART Doc I-Guide, but it is Required for the eNote
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/EntryDescription	Optional	A free form text container to describe the event or to log system specific codes or status values
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/EntryDatetime	Required	The date and time the event occurred.
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/ PerformedBySystemEntryIdentifier	Optional	Contains an identifier that was assigned by the system that performed the action.
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY/ AUDIT_TRAIL_ENTRY_DETAI L/PerformedBySystemName	Optional	Contains the name of the system used for performing the action.
DOCUMENT/AUDIT_TRAIL/ AUDIT_TRAIL_ENTRIES/ AUDIT_TRAIL_ENTRY_EVIDE NCE/FOREIGN_OBJECT	Prohibited	MUST NOT be included. The GSEs do not intend to use this capability, and its use could dramatically increase the size of the SMART Doc, causing problems for document transfer and storage.

The following example contains only the elements that are required to be present:

```
<AUDIT_TRAIL>
  <AUDIT_TRAIL_ENTRIES>
    <AUDIT_TRAIL_ENTRY SequenceNumber="1">
      <AUDIT_TRAIL_ENTRY_DETAIL>
        <EntryDatetime>2017-03-13T10:11:12.234-05:00</EntryDatetime>
        <EventType>PopulatedDocument</EventType>
        <PerformedByOrganizationName>Doc Prep Inc.</PerformedByOrganizationName>
        <PerformedBySystemEntryIdentifier>DPlv5-20051226-0af59237ed238ab1</PerformedBySystemEntryIdentifier>
      </AUDIT_TRAIL_ENTRY_DETAIL>
    </AUDIT_TRAIL_ENTRY>
</AUDIT_TRAIL>
```

The following example contains both the required and the optional elements for the Audit Trail Entry:

```
<AUDIT_TRAIL>
  <AUDIT_TRAIL_ENTRIES>
    <AUDIT_TRAIL_ENTRY SequenceNumber="3">
      <AUDIT_TRAIL_ENTRY_DETAIL>
        <EntryDatetime>2017-03-16T11:50:23-07:00</EntryDatetime>
        <EntryDescription>Tamper Seal Document</EntryDescription>
        <EventType>AppliedFinalTamperEvidentSignature</EventType>
        <PerformedByOrganizationName>Settlement Co.</PerformedByOrganizationName>
        <PerformedBySystemEntryIdentifier>921ab4ef248c7159f38743c6742583a3</PerformedBySystemEntryIdentifier>
      </AUDIT_TRAIL_ENTRY_DETAIL>
    </AUDIT_TRAIL_ENTRY>
  </AUDIT_TRAIL_ENTRIES>
</AUDIT_TRAIL>
```

d. AUDIT_TRAIL_ENTRY_EVIDENCE MUST NOT be included. The GSEs do not intend to use this capability, and its use could dramatically increase the size of the SMART Doc, causing problems for document transfer and storage.

e. DEAL_SETS – This holds the business data structures needed to support the eNote (see Section 6).

f. RELATIONSHIPS/RELATIONSHIP – XLINK. Enables the creation of relationships across different branches of the XML tree structure. It functions similarly to an association table in a relational database. The labels in the “from” and “to” attributes are analogous to foreign keys in a relational database. Used to link a SIGNATORY to a ROLE of a PARTY. Compared with the v1.2 eNote, there is much reduced use of XLINK, as the mapping of the data to the view fields is no longer used.

g. SIGNATORIES/SIGNATORY/EXECUTION/EXECUTION_DETAIL– The SIGNATORY element provides information about stakeholders, notaries, and/or witnesses. The ROLE element representing the signer is linked using a RELATIONSHIP (see section 6.i above). For the eNote, a SIGNATORY element MUST be provided for each signing borrower. SIGNATORY element MUST comply with the requirements stated in the table below:

Node Name	Usage	Notes
DOCUMENT/SIGNATORIES/ SIGNATORY/EXECUTION/@label	Required	A unique value MUST be provided to support RELATIONSHIP linkage
DOCUMENT/SIGNATORIES/ SIGNATORY/EXECUTION/ EXECUTION_DETAIL/ExecutionDate Or DOCUMENT/SIGNATORIES / SIGNATORY/EXECUTION/ EXECUTION_DETAIL/ ExecutionDatetime	Conditional	If the SIGNATORY uses XML DSIG, the date/time MUST be provided in the Signature/Object/QualifyingProperties/ SignedProperties/ SignedSignatureProperties/ SigningTime as specified in [MISMO- DSIG]. For other types of signature, either ExecutionDateTime or ExecutionDate MUST be provided. Use ExecutionDateTime when the exact time of the actual execution is known. Otherwise, use ExecutionDate.
SIGNATORY/EXECUTION_DETAIL / ActualSignatureType	Required	Specifies the type of signature applied to the document: For an eNote, the allowable values are Digital, Image, or Text.

The SIGNATORY element is linked to the ROLE element for the signer of the document using the RELATIONSHIP element. To support this linkage using the XLINK standard a unique value MUST be provided in the label attribute of the SIGNATORY element. The following is an example of a SIGNATORY element:

```
<SIGNATORIES>
  <SIGNATORY xlink:label="SIGNATORY_1" SequenceNumber="1">
    <EXECUTION>
      <EXECUTION_DETAIL>
        <ActualSignatureType>Image</ActualSignatureType>
        <ExecutionDate>2013-04-15</ExecutionDate>
      </EXECUTION_DETAIL>
    </EXECUTION>
  </SIGNATORY>
</SIGNATORIES>
```

h. SYSTEM_SIGNATURES/SYSTEM_SIGNATURE

The SYSTEM_SIGNATURE element is used to hold a Digital Signature that provides a tamper-evident seal on the document. See the *MISMO Digital Signature Implementation Guide* and the *MISMO SMART Doc PDF Implementation Guide* for detailed information about digital signatures. See also Section 11 of this document, Applying the Tamper Seal. In the examples below, the long strings in the SignatureValue and the X509Certificate elements have been truncated.

```
<SYSTEM_SIGNATURES>
  <SYSTEM_SIGNATURE>
    <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
      <SignedInfo>
        <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
        <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
        <Reference URI="">
          <Transforms>
            <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
          </Transforms>
          <DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
          <DigestValue>sf3eMnb8AsGme1keq+vuUF7qB6TilPaHu21yfWXXQt8=</DigestValue>
        </Reference>
      </SignedInfo>
      <SignatureValue>Dx2hw7C9gjP==</SignatureValue>
      <KeyInfo>
        <X509Data>
          <X509SubjectName>CN=MISMO SMARTDoc,OU=Tamper Evident,O=MISMO,L=Bremerton,ST=WA,C=US</X509SubjectName>
          <X509SubjectName>CN=MISMO SMARTDoc, OU=Tamper Evident, O=MISMO, L=Bremerton, ST=WA, C=US</X509SubjectName>
          <X509Certificate>MIIDfzCCA=</X509Certificate>
        </X509Data>
      </KeyInfo>
    </Signature>
  </SYSTEM_SIGNATURE>
</SYSTEM_SIGNATURES>
```

i. VIEWS/VIEW/VIEW_FILES/VIEW_FILE/FOREIGN_OBJECT

The VIEW element provides the visual representation of the document. A SMART Doc MUST provide at least one VIEW element. Additional VIEW elements MAY be provided to represent different snapshots of the document over time. For the Version 3 eNote, the VIEW is created as a PDF file. After signing, the PDF file is base-64 encoded, and the encoded string is placed into the DOCUMENT in the EmbeddedContentXML element, as shown below:

```
<VIEWS>
  <VIEW>
    <VIEW_FILES>
      <VIEW_FILE>
        <FOREIGN_OBJECT>
          <EmbeddedContentXML>
          <!--The Base 64 encoded PDF goes here -->
          </EmbeddedContentXML>
          <MIMETypeIdentifier>application/pdf</MIMETypeIdentifier>
          <ObjectEncodingType>Base64</ObjectEncodingType>
          <ObjectName>eNote</ObjectName>
        </FOREIGN_OBJECT>
      </VIEW_FILE>
    </VIEW_FILES>
  </VIEW>
</VIEWS>
```

If signatures are present in the VIEW, additional information regarding the signature is contained in the SIGNATORY element and is linked to the Role of the signing Party using a RELATIONSHIP. See sections 6.g Signatories and 6.f Relationships

j. DOCUMENT_CLASSIFICATION/DOCUMENT_CLASSES/DOCUMENT_CLASS/

The DOCUMENT_CLASSIFICATION, the DOCUMENT_CLASS and the Document_Type elements indicate what document type the instance of the SMART Doc contains, such as Note, Closing Disclosure, Security Instrument, etc. A SMART Doc MUST contain at least one DOCUMENT_CLASSES/DOCUMENT_CLASS as specified in the table below.

Node Name	Usage	Notes
DOCUMENT_CLASSES/ DOCUMENT_CLASS/ DocumentType	Required	The value "**Note**" MUST be used for the eNote.
DOCUMENT_CLASSES/ DOCUMENT_CLASS/ DocumentTypeOtherDescription	Prohibited	Not used for the eNote.

The following is an example of the DOCUMENT_CLASS container.

```
<DOCUMENT_CLASSIFICATION>
  <DOCUMENT_CLASSES>
    <DOCUMENT_CLASS>
      <DocumentType>Note</DocumentType>
    </DOCUMENT_CLASS>
  </DOCUMENT_CLASSES>
</DOCUMENT_CLASSIFICATION>
```

k. DOCUMENT_CLASSIFICATION/DOCUMENT_CLASSIFICATION_DETAIL – The DOCUMENT_CLASSIFICATION_DETAIL provides information about the form, its issuer and publisher. It also provides other metadata, including the AcceptableSigningMethodType, the DocumentNegotiableInstrumentIndicator, and the DocumentSignatureRequiredIndicator. See also Section 8 for information about the Fannie Mae and Freddie Mac Uniform Instruments.

Node Name	Usage	Notes
DOCUMENT_CLASSIFICATION_DETAIL/AcceptableSigningMethodType	Optional	The value "Electronic" is used for the eNote.
DOCUMENT_CLASSIFICATION_DETAIL/ocumentFormIssuingEntityNameType	Optional	The value "FNM_FRE" is used for the eNote if it is a shared uniform instrument. If it is specific to one of the GSEs, then FNM or FRE would be used, as appropriate.

Node Name	Usage	Notes
DOCUMENT_CLASSIFICATION_DETAIL/DocumentFormIssuingEntityNumberId entifier	Required	The form identifier for the Uniform Instrument as published by the GSEs
DOCUMENT_CLASSIFICATION_DETAIL/DocumentFormIssuingEntityVersionIdentifier	Optional	
DOCUMENT_CLASSIFICATION_DETAIL/DocumentName	Optional	The name of the uniform instrument as published by the GSEs. For example, Multistate Fixed Rate Note
DOCUMENT_CLASSIFICATION_DETAIL/ DocumentNegotiableInstrumentIndicator	Optional	The value “true” is used for the eNote.
DOCUMENT_CLASSIFICATION_DETAIL/DocumentPeriodEndDate	Optional	
DOCUMENT_CLASSIFICATION_DETAIL/DocumentPeriodStartDate	Optional	
DOCUMENT_CLASSIFICATION_DETAIL/DocumentRecordationProcessingType	Optional	The value “NoProcessingRequired” is used for the eNote.
DOCUMENT_CLASSIFICATION_DETAIL/DocumentSignatureRequiredIndicator	Optional	The value “true” is used for the eNote.

7. The PDF View

A significant change from the Version 1.02 SMART Doc specification is the use of PDF rather than XHTML as the display format for the viewable document. This change was made based on industry input, as mentioned above in Section 1.5.c. It makes the eNote consistent with the other documents used in the loan closing process, where PDF format is the norm.

a. PDF/A-3: In the MISMO SMART Doc PDF Implementation Guide, PDF/A-3 was specified because it includes all the requirements needed to make the PDF portable and consistent over time. It includes restrictions on Acro forms, scripts, fonts, etc. In the past, MISMO took the approach of listing custom restrictions to the PDF thru the MISMO eSigned PDF I-Guide. PDF/A was a better option than having a custom list of restrictions, as there plenty of third party tools to create and validate that spec. A good resource for technical and business-level information on PDF/A is https://www.pdfa.org/. The requirement for PDF/A is for after the document is fully executed. Document preparation and signing rooms may want to use AcroForm fields to specify the placeholders for the signatures, but they need to replace those with actual signature fields or some flat object when the document is executed. Section 3 of the I-Guide discusses this. A recent PRIA White Paper describes

advantages of the PDF/A format and notes that it is now the preferred document format for the Federal, State, and Local Court Systems.

b. Tamper sealing the PDF: There is no GSE requirement that the PDF file be tamper sealed using a digital signature or other means. If the lender or another party to the closing process wishes to have tighter control over the document, they are allowed to do so. To accomplish this, the PDF specification allows for the use of DocMDP signatures. These are partial tamper-evident seals that one can put over the fixed part of a document while still allowing downstream processes to add stakeholder signatures to that PDF file. For information on the use of partial tamper seals using digital signatures, see the *MISMO Digital Signature Implementation Guide*.

c. Americans with Disabilities Act (ADA) Compliance: This is a bigger issue for the eClosing platform than for the PDF View of the eNote. Although it is not a GSE requirement, it is a good practice for the PDF to comply with ADA requirements for accessibility. The eNote document poses no accessibility challenges as it does not contain tables, images, or external links. Watermarks should not be used. The font sizes should not be reduced from what is provided in the Uniform Instruments published by the GSEs. Some document creation tools can perform an ADA Accessibility Check. The PDF samples provided with this specification have passed an ADA Accessibility Check.

d. Base-64 Encoding: The MISMO LDD specifically says that the Base64 encoding MUST follow IETF RFC 4648 as documented in sections 3 and 4. This is important for interoperability as not all tools follow Base64 encoding. Information about this is provided in the MISMO Logical Data Dictionary.

e. Placing the encoded PDF View into the XML Document: After signing and encoding, the encoded string is placed into the FOREIGN_OBJECT in the EmbeddedContentXML element, as shown below:

```
<VIEWS>
  <VIEW>
    <VIEW_FILES>
      <VIEW_FILE>
        <FOREIGN_OBJECT>
          <EmbeddedContentXML>
          <!--The Base 64 encoded PDF goes here -->
          </EmbeddedContentXML>
          <MIMETypeIdentifier>application/pdf</MIMETypeIdentifier>
          <ObjectEncodingType>Base64</ObjectEncodingType>
          <ObjectName>eNote</ObjectName>
        </FOREIGN_OBJECT>
      </VIEW_FILE>
    </VIEW_FILES>
  </VIEW>
</VIEWS>
```

8. Uniform Instruments

Fannie Mae and Freddie Mac (the GSEs) have standardized the contents and wording for legal documents that are commonly used in the mortgage industry; these are referred to as Uniform Instruments. The Uniform Instruments for the Note are published on the GSE websites at the following links:

- Fannie Mae: https://www.fanniemae.com/singlefamily/notes
- Freddie Mac: http://www.freddiemac.com/uniform/unifnotes.html

The eNote instruments have the following content additions to what is found on the non-electronic instruments:

a. The MERS MIN is provided at the top of the document:

NOTE MERS MIN: 112233445566778899

b. In the line below the title, the text **(For Electronic Signature)** is provided. If the instrument already has other parenthetical subtitle text, **(For Electronic Signature)** follows the other items:

ADJUSTABLE RATE NOTE MERS MIN: 112233445566778899
(11th District Cost of Funds Index - Rate aps)
(For Electronic Signature)

c. In the footers on each page, the name of the instrument has "**e**NOTE" rather than "NOTE," and the Form Identifier has an "e" at the end, as "3200**e**":

MULTISTATE FIXED RATE eNOTE--Single Family--**Fannie Mae/Freddie Mac UNIFORM INSTRUMENT Form 3200e 5/05**

d. At the end of the text of the Note, the following long section is added. The number of the section will vary from instrument to instrument.

11. ISSUANCE OF TRANSFERABLE RECORD; IDENTIFICATION OF NOTE HOLDER; CONVERSION FROM ELECTRONIC NOTE TO PAPER-BASED NOTE

(A) I expressly state that I have signed this electronically created Note (the "Electronic Note") using an Electronic Signature. By doing this, I am indicating that I agree to the terms of this Electronic Note. I also agree that this Electronic Note may be Authenticated, Stored and Transmitted by Electronic Means (as defined in Section 11(F)), and will be valid for all legal purposes, as set forth in the Uniform Electronic Transactions Act, as enacted in the jurisdiction where the Property is located ("UETA"), the Electronic Signatures in Global and National Commerce Act ("E-SIGN"), or both, as applicable. In addition, I agree that this Electronic Note will be an effective, enforceable and valid Transferable Record (as defined in Section 11(F)) and may be created, authenticated, stored, transmitted and transferred in a manner consistent with and permitted by the Transferable Records sections of UETA or E-SIGN.

(B) Except as indicated in Sections 11 (D) and (E) below, the identity of the Note Holder and any person to whom this Electronic Note is later transferred will be recorded in a registry maintained by MERSCORP Holdings, Inc., a Delaware Corporation, or in another registry to which the records are later transferred (the "Note Holder Registry"). The authoritative copy of this Electronic Note will be the copy identified by the Note Holder after loan closing but prior to registration in the Note Holder Registry. If this Electronic Note has been registered in the Note Holder Registry, then the authoritative copy will be the copy identified by the Note Holder of record in the Note Holder Registry or the Loan Servicer (as defined in the Security Instrument) acting at the direction of the Note Holder, as the authoritative copy. The current identity of the Note Holder and the location of the authoritative copy, as reflected in the Note

Holder Registry, will be available from the Note Holder or Loan Servicer, as applicable. The only copy of this Electronic Note that is the authoritative copy is the copy that is within the control of the person identified as the Note Holder in the Note Holder Registry (or that person's designee). No other copy of this Electronic Note may be the authoritative copy.

(C) If Section 11 (B) fails to identify a Note Holder Registry, the Note Holder (which includes any person to whom this Electronic Note is later transferred) will be established by, and identified in accordance with, the systems and processes of the electronic storage system on which this Electronic Note is stored.

(D) I expressly agree that the Note Holder and any person to whom this Electronic Note is later transferred shall have the right to convert this Electronic Note at any time into a paper-based Note (the "Paper-Based Note"). In the event this Electronic Note is converted into a Paper-Based Note, I further expressly agree that: (i) the Paper-Based Note will be an effective, enforceable and valid negotiable instrument governed by the applicable provisions of the Uniform Commercial Code in effect in the jurisdiction where the Property is located; (ii) my signing of this Electronic Note will be deemed issuance and delivery of the Paper-Based Note; (iii) I intend that the printing of the representation of my Electronic Signature upon the Paper-Based Note from the system in which the Electronic Note is stored will be my original signature on the Paper-Based Note and will serve to indicate my present intention to authenticate the Paper-Based Note; (iv) the Paper- Based Note will be a valid original writing for all legal purposes; and (v) upon conversion to a Paper-Based Note, my obligations in the Electronic Note shall automatically transfer to and be contained in the Paper-Based Note, and I intend to be bound by such obligations.

(E) Any conversion of this Electronic Note to a Paper-Based Note will be made using processes and methods that ensure that: (i) the information and signatures on the face of the Paper-Based Note are a complete and accurate reproduction of those reflected on the face of this Electronic Note (whether originally handwritten or manifested in other symbolic form); (ii) the Note Holder of this Electronic Note at the time of such conversion has maintained control and possession of the Paper-Based Note; (iii) this Electronic Note can no longer be transferred to a new Note Holder; and (iv) the Note Holder Registry (as defined above), or any system or process identified in Section 11 (C) above, shows that this Electronic Note has been converted to a Paper-Based Note, and delivered to the then-current Note Holder.

(F) The following terms and phrases are defined as follows: (i) "Authenticated, Stored and Transmitted by Electronic Means" means that this Electronic Note will be identified as the Note that I signed, saved, and sent using electrical, digital, wireless, or similar technology; (ii) "Electronic Record" means a record created, generated, sent, communicated, received, or stored by electronic means; (iii) "Electronic Signature" means an electronic symbol or process attached to or logically associated with a record and executed or adopted by a person with the intent to sign a record; (iv) "Record" means information that is inscribed on a tangible medium or that is stored in an electronic or other medium and is retrievable in perceivable form; and (v) "Transferable Record" means an electronic record that: (a) would be a note under Article 3 of the Uniform Commercial Code if the electronic record were in writing and (b) I, as the issuer, have agreed is a Transferable Record."

e. Beyond this, additional text may be needed on the Note (paper or electronic), based on the jurisdiction or the terms of the mortgage. A list of changes that are authorized by the GSEs can be found on their websites:
   Freddie Mac: www.freddiemac.com/uniform/doc/unifnotesauth.doc
   Fannie Mae: www.fanniemae.com/singlefamily/notes (Standard and Negotiated Notes)

www.fanniemae.com/singlefamily/special-purpose-documents (Balloons and Refinance)
www.fanniemae.com/singlefamily/legal-documents (General Guidance)

When not otherwise specified, it is permitted to add such state-required text and data in the white space above the header at the beginning of the View, and near the bottom of the View, above the text "WITNESS THE HAND(S) AND SEAL(S) OF THE UNDERSIGNED" and the signature area.

9. Creating the Populated Document

Prior to closing, the documents that must be signed by or presented to the borrowers, including the eNote, are created by a Document Preparation ("Doc Prep") process. This process typically merges data from the Loan Origination System (LOS) with the standardized text required for each document. In the case of the eNote, two outputs are needed: the PDF (containing the merged data, text, and fields in which to place the signatures) and the XML file containing the business data (see Section 5) and technical data (see Section 6) in a structure that conforms to the MISMO XML Schema. The standardized text for the document is provided in the Uniform Instruments (see Section 8), and the data specification is provided in the *SMART Doc v3 eNote Data Mapping* referenced in Section 1.6.e.

a. The same data MUST be used to create both the PDF View and the XML data structures. A data mapping is available that documents what data in the XML structure corresponds to each field on the various Uniform Instruments discussed in Section 8. In the mapping, the instruments have been organized into groups, based on their data content and loan characteristics. Samples are also provided, consisting of a representative document for each group. Links will be provided when the specification is published. Detailed information about each data element is provided in Sections 5 and 6 of this specification.

b. Creating the Audit Trail Entry
   i. At a minimum, the EntryDateTime, the Event Type, with the value "PopulatedDocument," and the name of the organization that performed the action MUST be provided.
   ii. The other elements of AUDIT_TRAIL_ENTRY_DETAIL optionally MAY also be provided.
   iii. Do not use AUDIT_TRAIL_ENTRY_EVIDENCE
   iv. The following example contains only the elements that are required to be present:

```
<AUDIT_TRAIL>
  <AUDIT_TRAIL_ENTRIES>
    <AUDIT_TRAIL_ENTRY SequenceNumber="1">
      <AUDIT_TRAIL_ENTRY_DETAIL>
        <EntryDatetime>2017-03-13T10:11:12.234-05:00</EntryDatetime>
        <EventType>PopulatedDocument</EventType>
        <PerformedByOrganizationName>Doc Prep Inc.</PerformedByOrganizationName>
      </AUDIT_TRAIL_ENTRY_DETAIL>
    </AUDIT_TRAIL_ENTRY>
  </AUDIT_TRAIL_ENTRIES>
</AUDIT_TRAIL>
```

   v. The following example contains both the required and the optional elements for the Audit Trail Entry:

```
<AUDIT_TRAIL>
  <AUDIT_TRAIL_ENTRIES>
    <AUDIT_TRAIL_ENTRY SequenceNumber="1">
      <AUDIT_TRAIL_ENTRY_DETAIL>
        <EntryDatetime>2017-03-13T10:11:12.234-05:00</EntryDatetime>
        <EntryDescription>The data for the Note was stored into the SMARTDocument</EntryDescription>
        <EventType>PopulatedDocument</EventType>
        <PerformedByOrganizationName>Doc Prep Inc.</PerformedByOrganizationName>
        <PerformedBySystemEntryIdentifier>12345</PerformedBySystemEntryIdentifier>
        <PerformedBySystemName>DocPrep</PerformedBySystemName>
      </AUDIT_TRAIL_ENTRY_DETAIL>
    </AUDIT_TRAIL_ENTRY>
    </AUDIT_TRAIL_ENTRY>
  </AUDIT_TRAIL_ENTRIES>
</AUDIT_TRAIL>
```

c. The GSEs do NOT require a tamper seal to be applied to the document at this point. It is not required for the Version 1.02 eNote. A tamper seal would make the process more complex and the objective of this specification is to make the eNote easier. There is another optional way for service providers to enable verification as the document is passed between parties in the closing process:

   A hash of the document can be done by the sender and then may be used by the receiver to verify that it matches. A party MAY optionally apply a digital tamper seal if they have a need for it.

10. Signing

During the loan closing process, documents, including the Note are presented to the borrowers, who sign them. For an eNote this process will be performed electronically. The electronic signatures are placed into the eNote PDF, and information about the signatories and the signing event is placed into the eNote XML document, as described below. Further information can be found in the *MISMO Version 3 SMART Doc PDF Implementation Guide* (see Section 1.6.a) and the MISMO Digital Signature Implementation Guide (see Section 1.6.b).

a. Obtaining and recording the borrowers' intention to conduct an electronic transaction.
   i. This is essential in order to have a valid electronic signature. Documentation must be preserved.
   ii. There is standard text in the eNote that addresses this:

   I expressly state that I have signed this electronically created Note (the "Electronic Note") using an Electronic Signature. By doing this, I am indicating that I agree to the terms of this Electronic Note. I also agree that this Electronic Note may be Authenticated, Stored, and Transmitted by Electronic Means (as defined in Section 11(F)), and will be valid for all legal purposes, as set forth in the Uniform Electronic Transactions Act, as enacted in the jurisdiction where the Property is located ("UETA"), the Electronic Signatures in Global and National Commerce Act ("E-SIGN"), or both, as applicable. In addition, I agree that this Electronic Note will be an effective, enforceable, and valid Transferable Record (as defined in Section 11(F)) and may be created, authenticated, stored, transmitted, and transferred in a manner consistent with and permitted by the Transferable Records sections of UETA or E-SIGN.

b. Presentation of the Note to the borrowers for signing. The PDF View of the eNote will be presented to the borrower for signing on the eClosing platform and the signature action is captured.

c. The signature itself is placed into the PDF View. Along with this, the SIGNATORY element and one or more RELATIONSHIP elements are populated in the XML DOCUMENT. The following types of electronic signatures are supported:

i. Text: Denotes a text signature. The signer types his/her name (signature) in the signature field or clicks a button onscreen indicating acceptance or agreement. The following is an example of the signature as it appears in the PDF and of the associated XML data:

WITNESS THE HAND(S) AND SEAL(S) OF THE UNDERSIGNED.

Harry Michael Homeowner, Jr. (Seal)
Harry Michael Homeowner, Jr. - Borrower

Here is an example of the PARTY data for the Borrower. Note the xlink:label attributes, which are used to create the RELATIONSHIP elements.

```
<PARTY SequenceNumber="1" xlink:label="PARTY1_ROLE1">
  <INDIVIDUAL>
    <NAME>
      <FirstName>Harry</FirstName>
      <LastName>Homeowner</LastName>
      <MiddleName>Michael</MiddleName>
      <SuffixName>Jr</SuffixName>
    </NAME>
  </INDIVIDUAL>
  <ROLES>
    <ROLE xlink:label="PARTY1_ROLE1">
      <ROLE_DETAIL>
        <PartyRoleType>Borrower</PartyRoleType>
      </ROLE_DETAIL>
    </ROLE>
  </ROLES>
</PARTY>
```

Here is an example of the SIGNATORY element for this signature. Again, note the xlink:label attributes.

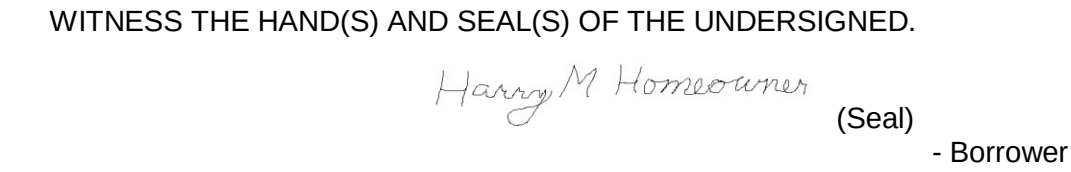
```
<SIGNATORY xlink:label="SIGNATORY_1" SequenceNumber="1">
  <EXECUTION>
    <EXECUTION_DETAIL>
      <ActualSignatureType>Text</ActualSignatureType>
      <ExecutionDate>2017-04-15</ExecutionDate>
    </EXECUTION_DETAIL>
  </EXECUTION>
</SIGNATORY>
```

Finally, here is an example of the RELATIONSHIP element used to link the SIGNATORY to the ROLE of the PARTY:

```
<RELATIONSHIPS>
   <RELATIONSHIP SequenceNumber="1" xlink:arcrole="urn:fdc:mismo.org:2009:residential/ROLE_IsAssociatedWith_SIGNATORY"
   xlink:from="PARTY1_ROLE1" xlink:to="SIGNATORY_1"/>
</RELATIONSHIPS>
```

Further information about each of these XML elements can be found above in Sections 5 and 6 of this document.

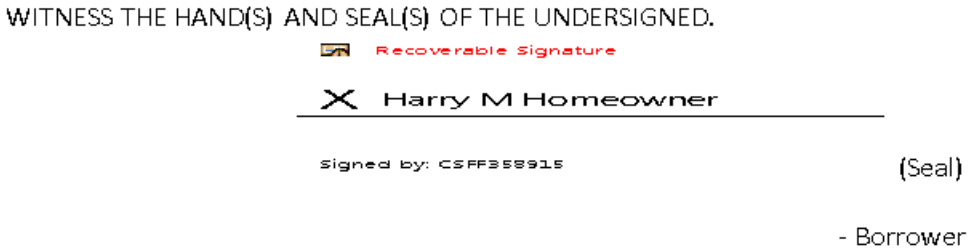
ii. Image: Denotes an image signature. A graphic image of the signer's signature is captured and placed in signature field. The following is an example of the Image signature as it appears in the PDF View:



The only difference in the XML data from the text signature above is the ActualSignatureType, which has the value "Image":

```
<SIGNATORY xlink:label="SIGNATORY_1" SequenceNumber="1">
   <EXECUTION>
      <EXECUTION_DETAIL>
         <ActualSignatureType>Image</ActualSignatureType>
         <ExecutionDate>2017-04-15</ExecutionDate>
      </EXECUTION_DETAIL>
   </EXECUTION>
</SIGNATORY>
```

iii. Digital: Denotes a digital signature. The signer uses a digital certificate to apply a PKI-based signature to the document. The certificate maybe a personal certificate of the signer, a system certificate, or a dynamically generated certificate created for that transaction. After signing, a signature appearance is generated and placed on the signature field in the view. For more details about digital signatures and an example, see Section 11, Applying the Tamper Seal.



The only difference in the XML data from the text signature above is the ActualSignatureType, which has the value "Digital":

```
<SIGNATORY xlink:label="SIGNATORY_1" SequenceNumber="1">
  <EXECUTION>
    <EXECUTION_DETAIL>
      <ActualSignatureType>Digital</ActualSignatureType>
      <ExecutionDate>2017-04-15</ExecutionDate>
    </EXECUTION_DETAIL>
  </EXECUTION>
</SIGNATORY>
```

iv. Other/ActualSignatureTypeOtherDescription – At this time, Other types of electronic signatures SHOULD NOT be used.

d. Creating the Audit Trail Entry

i. Do not use AUDIT_TRAIL_ENTRY_EVIDENCE

ii. The following example contains only the elements that are required to be present:

```
<AUDIT_TRAIL_ENTRY>
  <AUDIT_TRAIL_ENTRY_DETAIL>
    <EntryDatetime>2017-03-18T10:01:01.234-05:00</EntryDatetime>
    <EventType>SignedDocument</EventType>
    <PerformedByOrganizationName>Signing Service Inc.</PerformedByOrganizationName>
  </AUDIT_TRAIL_ENTRY_DETAIL>
</AUDIT_TRAIL_ENTRY>
```

The following example contains both the required and the optional elements for the Audit Trail Entry:

```
<AUDIT_TRAIL_ENTRY>
  <AUDIT_TRAIL_ENTRY_DETAIL>
    <EntryDatetime>2017-03-18T10:01:01.234-05:00</EntryDatetime>
    <EntryDescription>The data for the Note was stored into the SMARTDocument</EntryDescription>
    <EventType>SignedDocument</EventType>
    <PerformedByOrganizationName>Signing Service Inc.</PerformedByOrganizationName>
    <PerformedBySystemEntryIdentifier>99999999999999</PerformedBySystemEntryIdentifier>
  </AUDIT_TRAIL_ENTRY_DETAIL>
</AUDIT_TRAIL_ENTRY>
```

e. Placing the electronic signature and associated data into the eNote. The borrowers' electronic signatures MUST be applied to the PDF view.

f. Signing with a Power of Attorney. If the borrower designates another person to execute the note, using a Power of Attorney, the following elements are added to the document:

i. In addition to the PARTY element of the Borrower, another PARTY element is created to capture the name of the person who is signing and their PartyRoleType of AttorneyInFact:

```
<PARTY xlink:label="PARTY6">
 <INDIVIDUAL>
  <NAME>
   <FirstName>Buddy</FirstName>
   <LastName>Friend</LastName>
  </NAME>
```

```
</INDIVIDUAL>
<ROLES>
 <ROLE xlink:label="PARTY6_ROLE1">
  <ROLE_DETAIL>
   <PartyRoleType>AttorneyInFact</PartyRoleType>
  </ROLE_DETAIL>
 </ROLE>
</ROLES>
</PARTY>
```

ii. The RELATIONSHIP for the Signatory references the person who actually signed the eNote:

```
<RELATIONSHIP SequenceNumber="1"
  xlink:arcrole="urn:fdc:mismo.org:2009:residential/ROLE_IsAssociatedWith_SIGNATORY"
  xlink:from="PARTY6_ROLE1" xlink:to="SIGNATORY_1"/>
```

iii. A second RELATIONSHIP is created to link the Party with the Power of Attorney to the Borrower whom he/she represents:

```
<RELATIONSHIP SequenceNumber="2"
  xlink:arcrole="urn:fdc:mismo.org:2009:residential/ROLE_IsAttorneyInFactFor_ROLE"
  xlink:from="PARTY6_ROLE1" xlink:to="PARTY1_ROLE1_1"/>
```

iv. [**PLACEHOLDER** The document granting the power of attorney must be retained in the Loan File.]

g. After all signatures have been applied to the PDF, the PDF must be base-64 encoded and that encoded string placed into the XML DOCUMENT in the EmbeddedContentXML element, as shown below:

```
<VIEWS>
  <VIEW>
    <VIEW_FILES>
      <VIEW_FILE>
        <FOREIGN_OBJECT>
          <EmbeddedContentXML>
          <!--The Base 64 encoded PDF goes here -->
          </EmbeddedContentXML>
          <MIMETypeIdentifier>application/pdf</MIMETypeIdentifier>
          <ObjectEncodingType>Base64</ObjectEncodingType>
          <ObjectName>eNote</ObjectName>
        </FOREIGN_OBJECT>
      </VIEW_FILE>
    </VIEW_FILES>
  </VIEW>
</VIEWS>
```

11. Applying the Tamper Seal

After the eNote has been signed and the PDF View has been encoded and embedded into the XML document, the completed document is signed using a tamper-evident digital signature (a.k.a., "tamper sealed"). Further information can be found in the *MISMO Version 3 SMART Doc PDF Implementation Guide* (see Section 1.6.a) and the *MISMO Digital Signature Implementation Guide* (see Section 1.6.b). A step-by-step sample workflow with examples is provided in the DSIG in Section 9.2,

a. Attaching the Digital Signature: The digital signature is placed in the SYSTEM_SIGNATURE element of the MISMO reference model.

b. The digital signature employs the XML Digital Signature standard from the W3C. The namespace for this is as follows:

```
<Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
```

The XML schema specification for this standard can be can be obtained using the following link: **http://www.w3.org/TR/2002/REC-xmldsig-core-20020212/xmldsig-core-schema.xsd**

c. The Canonicalization Method should be specified as follows:

```
<CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
```

d. The secure hash algorithm (SHA) for encryption should be SHA-2 or higher, as follows:

```
<SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
```

e. For the tamper seal, an enveloped signature should be used, as follows:

```
<Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
```

f. The Digest contains a hash value calculated for the signed document. Again the secure algorithm for encryption should be SHA-2 or higher, as follows:

```
<DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
<DigestValue>sf3eMnb8AsGme1keq+vuUF7qB6TilPaHu21yfWXXQt8=</DigestValue>
```

g. The digital signature is placed in the SignatureValue element. In the following example, the long string has been truncated:

```
<SignatureValue>Dx2hw7C9gjP==</SignatureValue>
```

h. The Digital Certificate and the key information used to sign the document is placed in the X509Certificate element, within the KeyInfo element. In the example below, the long string in X509Certificate has been truncated.

```
<KeyInfo>
  <X509Data>
    <X509SubjectName>CN=MISMO SMARTDoc,OU=Tamper Evident,O=MISMO,L=Bremerton,ST=WA,C=US</X509SubjectName>
    <X509SubjectName>CN=MISMO SMARTDoc, OU=Tamper Evident, O=MISMO, L=Bremerton, ST=WA, C=US</X509SubjectName>
    <X509Certificate>MIIDfzCCAmegAwIBAgIEDON1+DANBgkq=</X509Certificate>
  </X509Data>
</KeyInfo>
```

i. The following is an example of an Audit Trail Entry for the event of applying the Final Tamper Evident Signature:

```
<AUDIT_TRAIL_ENTRY SequenceNumber="3">
  <AUDIT_TRAIL_ENTRY_DETAIL>
    <EntryDatetime>2017-03-16T11:50:23-07:00</EntryDatetime>
    <EntryDescription>Tamper Seal Document</EntryDescription>
    <EventType>AppliedFinalTamperEvidentSignature</EventType>
    <PerformedByOrganizationName>Settlement Co.</PerformedByOrganizationName>
    <PerformedBySystemEntryIdentifier>921ab4ef248c7159f38743c6742583a3</PerformedBySystemEntryIdentifier>
  </AUDIT_TRAIL_ENTRY_DETAIL>
</AUDIT_TRAIL_ENTRY>
```

12. Registration

Registration is the process of submitting information to register an eNote on the MERS eRegistry. In addition to certain loan and borrower information, the signature value of the tamper-evident digital signature is registered with MERS to enable subsequent consumers of the document to ensure that no alterations have been made to the eNote once registered. Registration of eNotes with MERS should occur as soon as possible once the final tamper-evident seal has been applied to the document, but must be completed within one business day.

Registration of an eNote with MERS can be accomplished by submission of the document to MERS (Presentation method), or via submission of required data points along with the signature value of the tamper-evident digital signature (Data Point method). Although the GSEs have required use of the Presentation method for registration of version 1.02 eNotes, this method of registration is currently limited to version 1.02 and is not yet a permissible option for the new version 3 format. For this reason, registration of version 3 eNotes will require use of the Data Point method. In the event that MERS updates the eRegistry to permit use of the Presentation method for version 3 eNotes, this requirement may be revisited by the GSEs. (Note: Specific information on requirements for Data Point eNote registrations is available from MERS).

13. Delivery of eNotes to the GSEs

Successful delivery of eNotes to the GSEs requires transmission of the eNote to the corresponding GSE eVault, as well as a transfer of Control and Location in the MERS eRegistry. The GSEs typically require use of MERS eDelivery for transmission of eNotes, however, if the submitting party is utilizing the same eVault provider as the GSE, use of MERS eDelivery is optional, but transfer of Control and Location is required to ensure appropriate parties are reflected in the Controller and Location fields within MERS eRegistry.

MERS eDelivery provides a method for distributing eNotes and other related documents contained within a MISMO eMortgage Package from one eRegistry member to another using the MERS eRegistry infrastructure and transaction security requirements. Per MERS® requirements, each eMortgage Package must be identified by a Mortgage Identification Number (MIN) which is registered

on the MERS eRegistry. A single eDelivery request may include one or more eMortgage Packages subject to the MERS size limitation of 5 MB per message. A single eDelivery request may include both version 3 and version 1.02 eNotes – each contained within separate eMortgage Packages. (Note: Specific information on MERS eDelivery requirements is available from MERS).