The DocumentReference class is used to create references to any of the reference documents specified in the reporting event’s `referenceDocuments` attribute (as described in the ReferenceDocument section). Document references may be created for any of the following:

- Documentation of the analysis as specified in the SAP and/or protocol
- Output displays in a clinical study report or integrated summary
- Program files containing programming code for specific analysis methods, for analyses, or for outputs

Class Diagram: DocumentReference

The ARS DocumentReference class corresponds with the Define-XML `def:DocumentRef` element that is referenced in the ARM for Define-XML specification:
A document reference must include the identifier of the reference document (as specified in the `referenceDocumentId` attribute) to indicate which document is being referenced. If needed, the document reference may also include 1 or more "page references" (each specified in the `pageRefs` attribute) to indicate the relevant page or pages within the reference document. A document reference that does not include any page references is a reference to the document as a whole. In general, there are 2 types of document reference:

- Documentation document references, which may be created for analysis methods, analyses or outputs by specifying 1 or more document references in the `documentRefs` attribute of the AnalysisMethod, Analysis, or Output classes, respectively. Only 1 document reference should be created for each document being referenced; `referenceDocumentId` should be unique within the set of instances of the DocumentReference class included in the `documentRefs` attribute. However, the document reference for a specific document may include multiple page references if it is necessary to reference different pages or sections of the document. See the AnalysisMethod, Analysis, or Output sections for more information about analysis methods, analyses and outputs.

- Programming code document references, which may be created for the template programming code associated with analysis methods, or for programming code for analyses or outputs. No more than 1 document reference may be created for the programming code associated any analysis method, analysis, or output and, when included, the document reference is specified in the `documentRef` attribute of:
  - The instance of the AnalysisProgrammingCodeTemplate class specified in the analysis method's `codeTemplate` attribute (see the AnalysisProgrammingCodeTemplate section for more information about template programming code)
  - The instance of the AnalysisOutputProgrammingCode class specified in the `programmingCode` attribute of the analysis or output (see the AnalysisOutputProgrammingCode section for more information about analysis and output programming code)

As programming code document references refer to program files (which usually only contain the set programming code statements for a single analysis method, analysis, or output), programming code document references usually do not include page references.

The abstract ARS `PageRef` class corresponds with the Define-XML `def:PDFPageRef` element that is referenced in the ARM for Define-XML specification:

<table>
<thead>
<tr>
<th>ARS PageRef Attributes</th>
<th>Corresponding Define-XML <code>def:PDFPageRef</code> Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>refType</td>
<td>Type</td>
</tr>
<tr>
<td>label</td>
<td>Title</td>
</tr>
<tr>
<td>pageNames</td>
<td>PageRefs</td>
</tr>
<tr>
<td>pageNumbers</td>
<td></td>
</tr>
<tr>
<td>firstPage</td>
<td>FirstPage</td>
</tr>
<tr>
<td>lastPage</td>
<td>LastPage</td>
</tr>
</tbody>
</table>

All page references must include an indication of the page reference type in the `refType` attribute, and may also include a description of the page reference in the `label` attribute. Individual pages or sets of pages may be referenced in different ways using any of the specializations of the abstract PageRef class:

- **PageNameRef** where:
  - `refType` is "NamedDestination"
  - `pageNames` contains one or more named destinations (e.g., bookmarks) in the reference document.

- **PageNumberListRef** where:
  - `refType` is "PhysicalRef"
  - `pageNumbers` contains one or more page numbers.

- **PageNumberRangeRef** where:
  - `refType` is "PhysicalRef"
  - `firstPage` contains the page number of the first page in a range of pages
  - `lastPage` contains the page number of the last page in the range of pages.

Multiple page references may be created for a single document reference if more than one type of page reference is required (e.g., reference to both a set of individual page numbers and a range of page numbers), if more than 1 range of pages needs to be specified, or if the sponsor prefers to assign different labels for page references of the same type.

Example

This example shows a selection of documentation document references specified in the `documentRefs` attribute of 1 analysis method, 1 analysis, and 2 outputs:
Show the “Summary by group of a categorical variable” analysis method, which has a single documentation document reference indicating that relevant information can be found on pages 9 and 11 of the reference document identified as “CDISCPILOT01_SAP”.

Show the “Summary of Change from Baseline by Treatment, Parameter and Visit” analysis, which has document references for 2 reference documents, indicating that:

- **Lines 18-27**: In the reference document identified as “CDISCPILOT01_SAP”, relevant information can be found on pages 9 and 17. The sponsor created 2 page separate page references in order to assign a specific label to each.
- **Lines 28-32**: In the reference document identified as “CDISCPILOT01_CSR”, relevant information can be found at the named destination “Table 14-7.02”. The sponsor chose not to specify a label for this page reference.

Show the “Summary of Demographics” output, which has a single documentation document reference indicating that relevant information can be found on pages 46 to 48 of the reference document identified as “CDISCPILOT01_CSR”.

Show the “Overall Summary of Treatment-Emergent Adverse Events” output, which has a single documentation document reference indicating that relevant information can be found in the reference document identified as “AE_Summary_Table_Shell”. No page reference was specified, which indicates that the whole reference document contains relevant information.

**YAML Example**

```yaml
methods:
  - id: Mth01_CatVar_Summ_ByGrp
    name: Summary by group of a categorical variable
    documentRefs:
      - referenceDocumentId: CDISCPILOT01_SAP
        pageRefs:
          - refType: PhysicalRef
            label: 7. GENERAL CONSIDERATIONS FOR DATA ANALYSES
            pageNumbers:
              - 9
              - 11
    ...  
  ...  
analyses:
  - id: An08_02_ChgBl_Summ_ByTrt
    name: Summary of Change from Baseline by Treatment, Parameter and Visit
    documentRefs:
      - referenceDocumentId: CDISCPILOT01_SAP
        pageRefs:
          - refType: PhysicalRef
            label: Section 7 (General Considerations)
            pageNumbers:
              - 9
          - refType: PhysicalRef
            label: Section 11.6 (Other Safety Measures)
            pageNumbers:
              - 17
      - referenceDocumentId: CDISCPILOT01_CSR
        pageRefs:
          - refType: NamedDestination
            pageNames:
              - Table 14-7.02
    ...  
  ...  
outputs:
  - id: Out14-1-1
    name: Summary of Demographics
    documentRefs:
      - referenceDocumentId: CDISCPILOT01_CSR
        pageRefs:
          - refType: PhysicalRef
            label: Table 14-2.01
            firstPage: 46
            lastPage: 48
    ...  
  - id: Out14-3-1-1
    name: Overall Summary of Treatment-Emergent Adverse Events
    documentRefs:
      - referenceDocumentId: AE_Summary_Table_Shell
        ...  
```

These documentation document references could be represented in tabular format as shown in the following table where:

- The type of object for which the document reference is defined is indicated in the “object_type” column, which contains the name of the object’s parent reporting event attribute.
• Each instance of 1 of the specializations of the PageRef class is shown on a separate row. If there are no page references for a document reference, a single row is shown for the document reference.
• Values of the id, name, and referenceDocumentId attributes is are shown on all rows relating to a document referenced for an object.
• Values from the pageNumbers and pageNames attributes have been transposed to be shown on a single row, with column names derived from the attribute name with a numeric suffix indicating the value ordinal (e.g., “pageNames1” for the first value of the pageNames attribute, “pageNumbers2” for the second value of the pageNumbers attribute).

<table>
<thead>
<tr>
<th>object_type</th>
<th>id</th>
<th>name</th>
<th>referenceDocumentId</th>
<th>refType</th>
<th>label</th>
<th>pageNumbers1</th>
<th>pageNumbers2</th>
<th>pageNames1</th>
<th>firstPage</th>
<th>lastPage</th>
</tr>
</thead>
<tbody>
<tr>
<td>methods</td>
<td>Mth01_CatV_ar_Summ_B_yGrp</td>
<td>Summary by group of a categorical variable</td>
<td>CDISCPILOT01_SAP</td>
<td>PhysicalRef</td>
<td>7. GENERAL CONSIDERATIONS FOR DATA ANALYSES</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td>An08_02_Ch_gBl_S_uumm_ByTrt</td>
<td>Summary of Change from Baseline by Treatment, Parameter and Visit</td>
<td>CDISCPILOT01_SAP</td>
<td>PhysicalRef</td>
<td>Sections 7 (General Considerations)</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td>An08_02_Ch_gBl_S_uumm_ByTrt</td>
<td>Summary of Change from Baseline by Treatment, Parameter and Visit</td>
<td>CDISCPILOT01_SAP</td>
<td>PhysicalRef</td>
<td>11.6 (Other Safety Measures)</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td>An08_02_Ch_gBl_S_uumm_ByTrt</td>
<td>Summary of Change from Baseline by Treatment, Parameter and Visit</td>
<td>CDISCPILOT01_CSR</td>
<td>NamedDestination</td>
<td>Table 14-7.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>outputs</td>
<td>Out14-1-1</td>
<td>Summary of Demographics</td>
<td>CDISCPILOT01_CSR</td>
<td>PhysicalRef</td>
<td>Table 14-2.01</td>
<td>46</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>outputs</td>
<td>Out14-3-1-1</td>
<td>Overall Summary of Treatment-Emergent Adverse Events</td>
<td>AE_Summary_Table_Shell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example

This example shows a selection of programming code document references specified in the documentRef attribute of the codeTemplate for 1 analysis method, and the programmingCode for 1 analysis and 2 outputs:

Lines 2-7: Show the code template specified for the “Analysis of variance group comparison for a continuous variable” analysis method, which indicates that relevant R version 4.2.3 program statements can be found in the reference document identified as “anova_R”. As there is no page reference, this indicates that the whole reference document contains relevant program statements.

Lines 11-25: Show the programming code specification for the “Comparison of Age Group by Treatment” analysis, which indicates that relevant SAS version 9.4 program statements can be found in the reference document identified as “PROGRAM_CATALOG_SAS” which, in this example, is a single file containing a combined set of programs, with a bookmark created for each program. The sponsor chose to create two separate page references in order to provide a descriptive label for each.

Lines 29-34: Show the programming code specification for the “Summary of TEAE by System Organ Class and Preferred Term” output, which indicates that relevant SAS version 9.4 program statements can be found in the reference document identified as “at14-5-01_sas”. As there is no page reference, this indicates that the whole reference document contains relevant program statements.
These programming code document references could be represented in tabular format as shown in the following table where:

- The type of object for which the document reference is defined is indicated in the "object_type" column, which contains the name of the object's parent reporting event attribute.
- Each instance of 1 of the specializations of the PageRef class is shown on a separate row. If there are no page references for a document reference, a single row is shown for the document reference.
- Values of the id, name, and referenceDocumentId attributes are shown on all rows relating to a document referenced for an object.
- Values from the pageNames attribute have been transposed to be shown on a single row, with column names derived from the attribute name with a numeric suffix indicating the value ordinal (e.g., "pageNames1" for the first value of the pageNames attribute).

<table>
<thead>
<tr>
<th>object_type</th>
<th>id</th>
<th>name</th>
<th>context</th>
<th>referenceDocumentId</th>
<th>refType</th>
<th>label</th>
<th>pageNames1</th>
</tr>
</thead>
<tbody>
<tr>
<td>methods</td>
<td>Mth04_ContVar_Com_p_Anova</td>
<td>Analysis of variance group comparison for a continuous variable</td>
<td>R Version 4.2.3</td>
<td>anova_R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>analyses</td>
<td>An03_02_AgeGrp_Comp_ByTrt</td>
<td>Comparison of Age Group by Treatment</td>
<td>SAS Version 9.4</td>
<td>PROGRAM_CATALOG_SAS</td>
<td>NamedDestination</td>
<td>Pearson chi-square macro definition</td>
<td>PearsonDef</td>
</tr>
<tr>
<td>outputs</td>
<td>Out14-3-2-1</td>
<td>Summary of TEAE by System Organ Class and Preferred Term</td>
<td>SAS Version 9.4</td>
<td>at14-5-01_sas</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"ReferenceDocument TerminologyExtension"