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Information technology — User interfaces — Universal remote console —

Part 5: Resource description

Technologies de l'information — Interfaces utilisateur — Console à distance universelle —

Partie 5: Description des ressources

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24752-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

ISO/IEC 24752 consists of the following parts, under the general title *Information technology — User interfaces — Universal remote console*:

— *Part 1: Framework*

— *Part 2: User interface socket description*

— *Part 3: Presentation template*

— *Part 4: Target description*

— *Part 5: Resource description*

Introduction

This part of ISO/IEC 24752 defines a format for describing atomic resources, grouping resources, resource sheets, user interface implementation descriptions, resource services, and resource directories relevant to the user interface of a device or service (“target”). For atomic resources that are stored in a resource sheet, a storage format is specified. For atomic resources that are stored externally to the resource sheet, the pertinent format type specification applies.

A *resource* is any object that is used as an entity or to support decision making in the construction of a concrete user interface. This part of ISO/IEC 24752 specifies how resources are described in the context of the universal remote console (URC) framework.

Atomic resources include text and non-text elements of a user interface such as labels, help text, keyboard shortcuts (access keys) and associated words (keywords). Non-text elements may include icons, sounds or videos. Atomic resources can be characterized as follows.

An atomic resource is of static nature, i.e. it does not change during the user’s interaction with the target.

NOTE This is not meant to exclude atomic resources that contain references (placeholders) to values of socket variables. In this case the atomic resource itself (i.e. the static text with the reference to the socket variable) doesn't change, but its rendition may change when the target’s state changes.

An atomic resource can be of any form, including textual, visual, auditory, and multimodal. This is reflected in the atomic resource’s type. Atomic resource types include text, sound, image, animation, and video clip. In this context animations and video clips are construed as static objects because they don’t change over the user interface’s lifetime (the recorded bits of the video clip don’t change when it is played).

An atomic resource of type “Text” is modality-independent, i.e. it can be rendered in visual, auditory, or tactile forms. Atomic resources of types other than “Text” are modality-specific.

An atomic resource is typically specific to the cultural, language, and functional accommodation of a user. For example, textual atomic resources are typically language specific; images can be culture-specific; picture symbols can be used to represent concepts that can be understood by people with certain cognitive disabilities.

An atomic resource can be replaced by a (supplemental) resource (which is itself an atomic resource).

Examples of atomic resources are the following:

— a text string used to label a window;

— a text string containing help for an interface element;

— an icon used to label a button;

— a Bliss symbol labeling a function;

— a sound file that announces help instructions;

— a text string that describes how to locate an ATM in a public building.

An *atomic resource description* specifies characteristics (as properties) of an atomic resource. Properties include its type, its use context, and the atomic resource’s storage location and format. The use context specifies the usage location (specific element in a specific user interface), usage role (e.g. label or help text), and language context pertaining to the application of an atomic resource. A sample atomic resource description is given in Annex A.

An atomic resource can have more than one atomic resource description, specifying additional properties and alternative property values, and several sets of use contexts. Also, atomic resource descriptions and the atomic resource they describe don't have to be stored in one file or on one server necessarily. For example, some atomic resources (e.g. images) can be stored as binary files, and their descriptions are stored in text files.

A *grouping resource* specifies a hierarchical grouping of user interface elements that is external to a socket description. This part of ISO/IEC 24752 applies grouping resources to user interface socket elements, but that is not a restriction in general. Groups of user interface (UI) elements can be nested, and subgroups and UI elements can occur multiple times within different groups. Grouping resources are structural hints as to how to present a concrete user interface made up of individual user interface elements, including user interface characteristics such as layout and navigation.

Supplemental resources can replace or supplement the target resources. By choosing between a set of alternative objects when constructing the concrete user interface, the result can be tailored towards user preferences and user device capabilities. The mechanism of supplemental resources facilitates the generation of specialized user interfaces that build on a common (modality-independent) user interface model, the user interface socket provided by the manufacturer of a target.

Atomic resource descriptions, grouping resources, and optionally the atomic resources themselves, are organized in *resource sheets*. A resource sheet is a file that contains atomic resource descriptions of related atomic resources, grouping resources, plus optionally the atomic resources themselves (if they are textual). Alternatively (and for binary atomic resources) the atomic resources can be stored in individual files separate from the resource sheet. Typically, a manufacturer would provide one resource sheet per target and language. Third parties can provide additional resource sheets pertaining to the same target. A sample resource sheet is provided as Annex C.

Resource sheets are referenced from *resource directories*. Resource directories can further contain references to user interface implementation descriptions (UIIDs), which are called *UIID descriptions,* and references to resource services, which are called *resource service descriptions.*

One purpose of this part of ISO/IEC 24752 is to facilitate the development and deployment of a wide variety of devices (from different manufacturers) that can act as URCs. The URC framework and its components are specified in ISO/IEC 24752-1. The user interface socket is specified in ISO/IEC 24752-2. It is a machine-interpretable description of the state and functions of the target. The target description is specified in ISO/IEC 24752-4. The presentation template is specified in ISO/IEC 24752-3.

Within the URC framework, an atomic resource makes reference to a specific element in a user interface socket (described in a user interface socket description), to a specific element in a target description, to a specific element in a presentation template, or any form of user interface implementation description in general.

Taken together, in the discovery phase a target description with labels and other atomic resources is used to present a description of the target to a user; in the control phase a user interface socket description with atomic resources and grouping resources, and optionally with a UIID, can be used to construct a concrete user interface that is tailored to the user's needs and preferences, through which a user can access and control the target.

NOTE Within the URC framework, there needs to be a common set of resource types and a common format for resource descriptions so that they can be used by any URC. This part of ISO/IEC 24752 defines both. In this part of ISO/IEC 24752, the terms "Resources" and "Resource Descriptions" (note the first letters are capitalized) include only those objects and descriptions that conform to the International Standard formats defined in this part of ISO/IEC 24752. It is important to note that URCs can employ other types of resources and resource descriptions beyond those described in this part of ISO/IEC 24752.

Information technology — User interfaces — Universal remote console —

Part 5: Resource description

1 Scope

ISO/IEC 24752 is a multi-part International Standard to facilitate operation of information and electronic products through remote and alternative interfaces and intelligent agents.

This part of ISO/IEC 24752 defines a syntax for describing atomic resources, resource sheets, user interface implementation descriptions, resource services, and resource directories relevant to the user interface of a device or service ("target").

2 Conformance

An extensible markup language (XML) fragment is an atomic resource description in conformance with this part of ISO/IEC 24752 if its outer element is <res:AResDesc> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 6. An atomic resource description may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

An XML fragment is a grouping resource in conformance with this part of ISO/IEC 24752 if its outer element is <res:Grouping> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 6. A grouping resource may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

A Resource Description Framework (RDF) / XML file is a resource sheet in conformance with this part of ISO/IEC 24752 if

- it has the MIME type specified in 8.8, if applicable, and
- its root element is <res:ResSheet> (with res: representing the namespace http://myurc.org/ns/res#), as specified in Clause 7.

A resource sheet may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

An XML fragment is a user interface implementation description (UIID) in conformance with this part of ISO/IEC 24752 if its outer element is <res:UiidDesc> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 9. A UIID description may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

An XML fragment is a resource service description in conformance with this part of ISO/IEC 24752 if its outer element is <res:ResSvcDesc> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 10. A resource service description may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

An XML fragment is a resource directory in conformance with this part of ISO/IEC 24752 if its outer element is <res:ResDir> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 11.

An XML/RDF file is a resource directory file in conformance with this part of ISO/IEC 24752 if

- it has the MIME type specified in 11.7, if applicable, and
- if its outer element is <res:ResDir> (with res: representing the namespace http://myurc.org/ns/res#) as specified in Clause 11.

A resource directory XML fragment or file may use language extensions if the extensions are coded in RDF/XML syntax, and if it follows the syntax and requirements outlined in this part of ISO/IEC 24752 for all of its non-extension parts.

NOTE URC manufacturers are encouraged to implement their URCs so that unrecognized markup (that may belong to unknown language extensions) is ignored without failing.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE All references in this clause were correct at the time of approval of this part of ISO/IEC 24752. The provisions of the referenced specifications, as identified in this subclause, are valid within the context of this part of ISO/IEC 24752 . The reference to a specification within this part of ISO/IEC 24752 does not give it any further status within ISO/IEC; in particular, it does not give the referenced specification the status of an International Standard.

ISO/IEC 10646:2003, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

ISO 15836:2003, *Information and documentation — The Dublin Core metadata element set*

ISO/IEC 24752-1, *Information technology — User interfaces — Universal remote console — Part 1: Framework*

DCMI Metadata Terms, http://dublincore.org/documents/dcmi-terms/

IETF RFC 2046, Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types, November 1996, http://www.ietf.org/rfc/rfc2046.txt

IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, January 2005, http://www.ietf.org/rfc/rfc3986.txt

W3C Recommendation: Extensible Markup Language (XML) 1.0 (Third Edition), W3C Recommendation, 04 February 2004, http://www.w3.org/TR/2004/REC-xml-20040204/

W3C Recommendation: Namespaces in XML, World Wide Web Consortium, 14 January 1999, http://www.w3.org/TR/1999/REC-xml-names-19990114/

W3C Recommendation: RDF/XML Syntax Specification (Revised), W3C Recommendation, 10 February 2004. http://www.w3.org/TR/2004/REC-rdf-syntax-grammar-20040210/

W3C Recommendation: XML Schema Part 2: Datatypes, W3C Recommendation, 02 May 2001, http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 24752-1 and the following apply.

4.1
anonymous atomic resource
atomic resource that has no global identifier

4.2
anonymous resource
resource that has no global identifier

4.3
atomic resource description
description of an atomic resource in terms of its properties

4.4
language extension
addition of elements, attributes or values to an XML-based language beyond the original language specification

NOTE Language extensions can be provided by standards organizations, consortia, vendors or other organizations.

4.5
target instance identifier
identifier for a target instance that is unique among all targets with the same name

[ISO/IEC 24752-1]

4.6
UIID description
collection of properties pertaining to a user interface implementation description (UIID)

NOTE A UIID description provides "scents" of a UIID that is referenced as an external file. A UIID description is given in the Resource Description Framework (RDF) format.

5 Relation to other standards

5.1 Relation to Dublin Core Metadata Element Set

This International Standard adopts some of the metadata properties defined within the Dublin Core Metadata Initiative (DCMI) Terms, a standard for the description of cross-domain information. Where appropriate, the syntax employed follows the Dublin Core Metadata Initiative recommendations for expressing qualified Dublin Core in RDF/XML format, as defined in the document "Expressing Qualified Dublin Core in RDF/XML" (http://dublincore.org/documents/dcq-rdf-xml/).

5.2 Relation to XML

This Standard defines an XML based language. Markup in XML is case sensitive.

Tag names, and attribute names and values are not localizable, i.e. they are identical for all international languages. However, the text content between tags can be language specific. As with all XML based languages, white space characters immediately surrounding tags are non-significant.

This specification makes use of the XML namespaces concept to enable the import of element and attribute names defined elsewhere.

All element and attribute names used in this document with no namespace prefix are defined by this International Standard and are part of the resources namespace with URI http://myurc.org/ns/res#. The namespace identifier 'res' should be used for it, if not defined as default namespace.

Throughout this document, the following namespace prefixes and corresponding namespace identifiers are used for referencing foreign namespaces:

xsd: The XML Schema namespace (http://www.w3.org/2001/XMLSchema),

rdf: The Resource Description Framework namespace (http://www.w3.org/1999/02/22-rdf-syntax-ns#),

dc: The Dublin Core Metadata Element Set V1.1 namespace (http://purl.org/dc/elements/1.1/), as specified in ISO 15836:2003, and

dcterms: The DCMI Metadata Terms namespace (http://purl.org/dc/terms).

5.3 Relation to resource description framework (RDF)

This specification uses the RDF/XML syntax for the description of resources. The URI http://myurc.org/ns/res# references an informative RDF schema document (see Annex B) which describes the RDF vocabulary for resource sheets as described in this International Standard.

It is important to note that conformance is based on the XML syntax described by the normative parts of this International Standard, and RDF support is not required for parsing files that implement this International Standard. Therefore general XML/RDF syntax transformation rules (such as representing properties as attributes rather than as elements and other shortcuts) shall not be used for XML fragments claiming conformance to this International Standard.

NOTE XML/RDF syntax transformations might become possible in a later version of this International Standard.

6 Atomic resource – <AResDesc>

6.1 General

An atomic resource description describes a given atomic resource in terms of its properties, including in what context the atomic resource may be applied. An atomic resource is a resource that is used as an atomic entity in the construction of a concrete user interface. Some properties of atomic resources are optional, and some may occur several times for one atomic resource.

An atomic resource description is described in the XML format, coded in UCS according to ISO/IEC 10646. It is specified by the <AResDesc> element which may occur one or multiple times in a resource sheet (see 8).

An atomic resource description is part of a resource sheet (see 8). Separate atomic resource descriptions pertaining to the same atomic resource are merged by the parser. This is even true for atomic resource descriptions that are contained in separate resource sheets.

EXAMPLE:

```
<AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#temperature_label">
    <content rdf:parseType="Literal" xml:lang="en">Temperature</content>
    <useFor rdf:parseType="Collection“>
        <Context>
            <eltRef rdf:resource="http://example.com/thermometer/socket#temperature" />
            <role rdf:resource="http://myurc.org/ns/res#label" />
            <forLang>en</forLang>
        </Context>
    </useFor>
    <dc:publisher>MyCorp, Inc.</dc:publisher>
    <dc:type>Text</dc:type>
</AResDesc>
```


6.2 The ‘rdf:about’ attribute

The ‘rdf:about’ attribute specifies an unambiguous identifier of an atomic resource. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI as specified in IETF RFC 3986), including a trailing fragment identifier.

The URI may or may not be resolvable.

NOTE 1 Target manufacturers and resource providers are encouraged to make atomic resource descriptions publicly available by posting the atomic resource description at the URI specified by the ‘rdf:about’ attribute.

The ‘rdf:about’ attribute may be present. If it is not present, the pertaining atomic resource description is called "anonymous atomic resource description".

NOTE 2 Use the <contentAt> element to specify URIs that are specific to a local network environment.

A good practice is to use as identifier the identifier (URI) of the resource sheet that contains the atomic resource description, followed by a hash sign '#', followed by a fragment identifier that is unique within the resource sheet (see example above).

An atomic resource description should be stable as much as possible. If an atomic resource description needs to be changed after it was made available to URCs or resource services, its identifier (‘rdf:about’ attribute) should be changed as well.

NOTE 3 The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

6.3 The <content> element

6.3.1 General

The <content> element provides the content of the atomic resource in XML-encoded form.

EXAMPLE:

<content rdf:parseType="Literal" xml:lang=”en”>Temperature</content>

The <content> element may occur exactly once if there is no <contentAt> element (see 6.4). It shall not occur if there is a <contentAt> element.

NOTE 1 An atomic resource description that has neither <content> nor <contentAt> elements may be used to add use context to an atomic resource that is described somewhere else.

NOTE 2 There is no pertinent Dublin Core metadata element for <content>.

6.3.2 The ‘rdf:parseType’ attribute

The ‘rdf:parseType’ attribute shall be attached to <content>, and its value shall be "Literal". This indicates that the atomic resource itself is an XML object that potentially contains other XML tags.

NOTE The ‘rdf:parseType’ attribute is necessary to conform to RDF/XML syntax rules, see RDF/XML Syntax Specification (Revised), section 2.8.

6.3.3 The ‘rdf:dataType’ attribute

Binary atomic resources (such as images) can be specified in textual encoding, for example in the xsd:base64Binary encoding. In this case, the ‘rdf:dataType’ attribute may be used to identify the type of the text content for the XML parser. Note that the value of the ‘rdf:dataType’ attribute shall be a URI (as specified in IETF RFC 3986), e.g. http://www.w3.org/2001/XMLSchema#base64Binary for the xsd:base64Binary datatype.

Alternatively, binary atomic resources may be stored as separate files and referenced via URI (see 6.4).

NOTE The use of the ‘rdf:dataType’ attribute follows RDF/XML Syntax Specification (Revised), section 2.9.

6.3.4 The ‘xml:lang’ attribute

The attribute xml:lang may be attached to a <content> element to specify the language of the atomic resource content.

For text atomic resources, the language of the atomic resource should be identified by an ‘xml:lang’ attribute, as defined by Extensible Markup Language (XML) 1.0, Second Edition, section 2.12.

NOTE 1 The coding schema for xml:lang is specified by IETF RFC 2277, “IETF Policy on Character Sets and Languages,” with reference to RFC 3066, “Tags for the Identification of Languages” (successor of IETF 1766).

NOTE 2 The Dublin Core Metadata element language (http://purl.org/dc/elements/1.1/language) is equivalent with the ‘xml:lang’ attribute of a element that contains the textual atomic resource as a whole.

NOTE 3 If the text of the atomic resource consists of parts in different languages, the ‘xml:lang’ attribute on the <content> element specifies the default language for the text. Language changes within the text should be marked using elements inside the text (see 6.3.5).

NOTE 4 The use of the ‘xml:lang’ attribute in RDF follows RDF/XML Syntax Specification (Revised), section 2.7.

6.3.5 The element

6.3.5.1 General

<content> may have one or more subelements for the purpose of specifying language changes inside textual content, and segmentation of long help texts ("layered help"). elements may be nested.

EXAMPLE A French word is used inside an English text.

```
<content rdf:parseType="Literal" xml:lang="en-ca">
        Do you have a <span xml:lang="fr-ca">'Carnet de Passages en Douane'</span> issued by the Canadian Automobile Association?
</content>
```

 elements may be nested.

Any element may have an id attribute.

6.3.5.2 The ‘xml:lang’ attribute

Language changes inside text atomic resources should be identified by enclosing the foreign-language content string in a element with an ‘xml:lang’ attribute, as defined by Extensible Markup Language (XML) 1.0, Second Edition, section 2.12.

6.3.5.3 The ‘title’ attribute

The ‘title’ attribute for is useful to break up long help texts in "layers". Each layer is contained in a element, with the ‘title’ attribute specifying a natural language title for the layer.

EXAMPLE:

```
<content rdf:parseType=”Literal” xml:lang=”en”>
    <span title="Intro">
        This will reset the maximum and minimum temperature.
    </span>
    <span title="Maximum and minimum temperature">
        The maximum temperature is the highest temperature that was measured since the last reset. The minimum temperature is the lowest temperature that was measured since the last reset.
    </span>
</content>
```

The title should be in the language specified by the closest 'xml:lang' attribute of any containing or <content> element.

NOTE A element may have both a xml:lang and a 'title' attribute to combine title specification and language change.

6.3.5.4 The <value> element

Textual atomic resources that apply to elements of a socket description or UIID description (including presentation template), may contain references to socket variables in order to facilitate the inclusion of dynamic text fragments within an atomic resource. The reference in the atomic resource will be replaced by the value of the referenced socket variable at runtime, and updated whenever the value changes.

An empty <value> element is used to specify the location within the atomic resource where the value of the socket variable should be inserted. The value of the *ref* attribute specifies the pertaining socket variable in XPointer syntax, i.e. the URI (see IETF RFC 3986) of the pertaining socket description, a hash sign (#), and the id of the socket variable.

EXAMPLE A label for the checkReset notify of the socket description for the digital thermometer could include the current temperature, which will be used as the new value for the maximum and minimum variables.

```
<AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#checkReset_label">
    <content rdf:parseType="Literal" xml:lang=”en”>
        Are you sure you want to reset the maximum and minimum temperature to
        <value ref="http://example.com/thermometer/socket#temperature" /> ?
    </content>
</AResDesc>
```

The <value> element shall not be applied to Textual atomic resources pertaining to elements of a target description. Since there is no control session involved in the discovery phase, there is no access to socket variables at that time.

6.4 The <contentAt> element

<contentAt> specifies a local URI (as specified in IETF RFC 3986) that can be used to retrieve the external content for the described atomic resource from a local network (i.e. the target-URC network (TUN) within the URC framework), without requiring a general Internet connection.

The URI shall be specified as value of the attribute 'rdf:resource' which shall be present. The URI may be relative, in which case it is based on the resource sheet's URI. This format works for both textual and binary atomic resources.

<contentAt> may occur any number of times to identify multiple copies that are available on a local network. <contentAt> shall not occur if the <content> element is specified (see 6.3) for an atomic resource description.

EXAMPLE 1 <contentAt rdf:resource=”images/temperature.gif” />

In this example a relative URI is specified; its absolute interpretation is based on the URI of the containing resource sheet.

EXAMPLE 2 If the resource sheet URI is http://192.168.0.1/rsheet.rdf (a URL), the absolute URI of the external atomic resource would be http://192.168.0.1/images/power.gif.

NOTE The <contentAt> element is meaningful only in a local network environment. This element (with its value) is an exception to the general RDF principle that separate statements on the same resource (with the same identifier) can be merged and are valid on a global scale.

6.5 The <dc:type> element

The <dc:type> element specifies the nature or genre of an atomic resource. It applies to atomic resources that are defined as part of the atomic resource description (see 6.3), as well as to atomic resources that are stored externally to the atomic resource description.

The values for the element content are defined by the Dublin Core vocabulary for type (http://www.dublincore.org/documents/dcmi-type-vocabulary/).

Values include, but are not limited to:

“Text” for textual atomic resources.

“Image” for pictorial atomic resources. In this case, the <dc:format> element (see 6.6) specifies the format type of the atomic resource.

<dc:type> may be present any number of times. Its default value is “Text”.

In addition to the <dc:type> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:type> elements from the containing resource sheet (see 8.6.4).

EXAMPLE <dc:type>Text</dc:type>

NOTE <dc:type> conforms to the Dublin Core metadata element type, http://purl.org/dc/elements/1.1/type. Its values are specified in the Dublin Core vocabulary for type (http://www.dublincore.org/documents/dcmi-type-vocabulary/).

6.6 The <dc:format> element

The <dc:format> element specifies the digital manifestation of the atomic resource, as format type (as defined by the Dublin Core Metadata Element Set, see ISO 15836:2003). <dc:format> shall not be defined more than once for one atomic resource.

<dc:format> shall be present if <dc:type> is "Image" or if the atomic resource is provided externally to the resource sheet (see 6.4). Otherwise it may be present. If it is missing, a default value of "text/xml" is assumed.

Exception: An atomic resource shall inherit the <dc:format> element from its containing resource sheet if available (see 8.6.5). If <dc:format> is specified for a resource sheet, it shall not occur within any <AResDesc> element contained in the resource sheet.

EXAMPLE <dc:format>image/jpeg</dc:format>

A label whose content is an unformatted character sequence with a dc:type value of “Text” and a dc:format value of “text/xml” or “application/xml” is called a “text label”.

NOTE <dc:format> conforms to the Dublin Core metadata element format, http://purl.org/dc/elements/1.1/format.

6.7 The <useFor> element

6.7.1 General

An atomic resource shall have none or one <useFor> element.

The <useFor> element specifies where and how the atomic resource can be applied. A use context consists of up to six different components: "element reference", "value reference", “operation reference”, "role", "language context", and “target instance”.

EXAMPLE:

```
<AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#temperature_label">
    <content rdf:parseType="Literal" xml:lang="en">Temperature</content>
    <useFor rdf:parseType="Collection">
        <Context>
            <eltRef rdf:resource="http://example.com/thermometer/socket#temperature"/>
            <role rdf:resource="http://myurc.org/ns/res#label"/>
            <forLang>en</forLang>
        </Context>
    </useFor>
    <dc:publisher>MyCorp, Inc.</dc:publisher>
    <dc:type>Text</dc:type>
</AResDesc>
```

NOTE If a resource description has no <useFor> element, a use context can be added for it by another resource description.

6.7.2 The 'rdf:parseType' attribute

The <useFor> element shall have an 'rdf:parseType' attribute with value "Collection".

NOTE The 'rdf:parseType' attribute is necessary to conform to RDF/XML syntax rules, see RDF/XML Syntax Specification (Revised), section 2.16.

6.7.3 The <Context> element

<useFor> may have any number of <Context> elements, each of which introduces a container for the components of a use context.

EXAMPLE:

```
<useFor rdf:parseType="Collection">
    <Context>
        <eltRef rdf:resource="http://example.com/thermometer/socket#temperature"/>
        <role rdf:resource="http://myurc.org/ns/res#label"/>
        <forLang>en</forLang>
    </Context>
</useFor>
```

6.7.3.1 The <eltRef> element

<eltRef> specifies a reference to a specific element in a specific structure. The structure may be either one of a socket, a UIID (including presentation template as a subtype of UIID), or a target description.

EXAMPLE <eltRef rdf:resource="http://example.com/thermometer/socket#temperature" />

The element reference is specified as value of the attribute 'rdf:resource' which shall be present. Its format is a URI (as specified in IETF RFC 3986), followed by a pound sign '#' and a trailing fragment identifier.

NOTE This syntax follows the common way of concatenating URIs with fragment identifiers, and is compatible with the XPointer framework.

<eltRef> shall be present and shall occur exactly once within a <Context> element.

Here is a list of elements that <eltRef> can point to. Any one of these elements shall therefore bear an id when defined in their documents.

Socket description – root element <uiSocket>

Socket description – variable

Socket description – constant element

Socket description – command

Socket description – notification

Socket description – type definition

Presentation template – root element <pret>

Presentation template – (all interactors)

Target description – root element <target>

Target description – location

Target description – locator

Target description – socket

6.7.3.2 The <valRef> element

<valRef> specifies a reference to a specific value that the specified element (given by <eltRef>) can have and to which the atomic resource applies to.

The value reference is specified as content of the <valRef> element.

EXAMPLE The label "Fahrenheit" is defined for the value "F" of the element scale in the socket. Alternatively, an image could be defined for the value "Fahrenheit".

```
<AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#scale_Fahrenheit">
    <content rdf:parseType="Literal" xml:lang="en">Fahrenheit</content>
    <useFor rdf:parseType="Collection“>
        <Context>
            <eltRef rdf:resource="http://example.com/thermometer/socket#scale" />
            <valRef>F</valRef>
            <role rdf:resource="http://myurc.org/ns/res#label" />
            <forLang>en</forLang>
        </Context>
    </useFor>
</AResDesc>
```

<valRef> may occur any number of times inside <Context>. If it is missing or empty, the atomic resource applies to the referenced element as a whole, rather than to a specific value. If specified multiple times, the resource applies to multiple values of the referenced element.

<valRef> may not be applied to elements of a target description.

6.7.3.3 The <opRef> element

<opRef> specifies a reference to a specific operation on the specified element (given by <eltRef>). Operations are referenced by a URI (see IETF RFC 3986) which is the value of the ‘rdf:resource’ attribute.

EXAMPLE <opRef rdf:resource="http://myurc.org/ns/res#up" />

The <opRef> element may be used to provide a resource (such as a label, help text, keyword or access key) for a specific operation on a socket variable or UIID interactor.

<opRef> may occur any number of times inside <Context>. If it is missing, the atomic resource applies to the referenced element or to its value directly, rather than to a specific operation on the element. If specified multiple times, the resource applies to multiple operations on the referenced element.

A <Context> element shall either have:

(a) no <valRef> and no <opRef> elements;

(b) at least one <valRef> and no <opRef> elements; or

(c) no <valRef> and at least one <opRef> elements.

Operation references include but are not limited to:

http://myurc.org/ns/res#up – increase operation for types that have a totally ordered value space. This URI shall only be used in a useFor that references either a socket variable whose type has the fundamental facet ordered="total", or that references a range interactor.

http://myurc.org/ns/res#down – decrease operation for types that have a totally ordered value space. This URI shall only be used in a useFor that references either a socket variable whose type has the fundamental facet ordered="total", or that references a range interactor.

NOTE: Descriptions of the referenced operations can be found at their URIs (e.g. at http://myurc.org/ns/res#up. Resource providers who see the need for additional operation references are encouraged to define new operation reference URIs (in domains other than http://myurc.org/ns/res), and to provide pertinent descriptions at the locations of the new URIs.

6.7.3.4 The <role> element

<role> specifies how the atomic resource should be applied to the given element and value. <role> shall be present and shall occur exactly once within a <Context> element.

Exception: An atomic resource shall inherit the <role> element from its containing resource sheet if available (see 8.6.7). If <role> is specified for a resource sheet, it shall not occur within any <AResDesc> element contained in the resource sheet.

The role is specified as URI (see IETF RFC 3986) given as value of the 'rdf:resource' attribute.

EXAMPLE <role rdf:resource="http://myurc.org/ns/res#label" />

Roles include but are not limited to:

http://myurc.org/ns/res#label - The atomic resource is used to present the element in a user interface.

http://myurc.org/ns/res#help, *http://myurc.org/ns/res#help-purpose*, or *http://myurc.org/ns/res#help-effect* - The atomic resource is used as a help item in a user interface. The International Standard defines the two help categories "purpose" and "effect". http://myurc.org/ns/res#help-purpose specifies that the atomic resource is a statement of the purpose of the element. http://myurc.org/ns/res#help-effect specifies that the atomic resource is a (longer) explanation of the relationship between the state of the element and the state of the target.

http://myurc.org/ns/res#accesskey - This role specifies a single character that can be used in combination with a platform-specific modifier key to move the focus to the element. If the element is bound to a socket command, it will be activated.

http://myurc.org/ns/res#keyword - The atomic resource is a keyword pertaining to the referenced element. Keywords may be used to support other types of navigation through a user interface, such as search or natural language based.

http://myurc.org/ns/res#location - The atomic resource is a location description pertaining to the referenced element. Location descriptions may be applied to <target> elements of target descriptions (see ISO/IEC 24752-4) to provide location information for target devices.

NOTE: Descriptions of the roles can be found at their URIs (e.g. at http://myurc.org/ns/res#label. Resource providers who see the need for additional roles are encouraged to define new role URIs (in domains other than http://myurc.org/ns/res), and to provide pertinent descriptions at the locations of the new URIs.

6.7.3.5 The <forLang> element

<forLang> describes the general language context in which the atomic resource can be applied. <forLang> shall contain a language identifier as text content, or be empty. The format and coding schema of the language identifier is the same as for the 'xml:lang' attribute (see 6.3.5.2). In addition, an empty <forLang> element indicates that the atomic resource is language-independent.

<forLang> may be present any number of times. If specified multiple times with different values (language identifiers), the resource can be applied in multiple language contexts.

In addition to the <forLang> elements specified within the <Context> element of an atomic resource, the atomic resource shall inherit all <forLang> elements from the containing resource sheet (see 8.6.2).

EXAMPLE An atomic resource intended to be used only as part of an English user interface would be specified as:
<forLang>en</forLang>

NOTE In general, the language context <forLang> is different from the language coding by attribute xml:lang. For example, an English movie title (which is an atomic resource) may be shown as part of a Spanish TV user interface.

6.7.3.6 The <forTargetInstance> element

<forTargetInstance> specifies the target instance for which the atomic resource can be applied. A target instance identifier (as string) shall be provided as element content. See ISO/IEC 24752-1 for target instance identifier.

<forTargetInstance> may occur any number of times as subelement of <Context>. If it occurs multiple times, the atomic resource applies to every target instance specified.

EXAMPLE <forTargetInstance> AB-3D-7F-3E </forTargetInstance>

NOTE The <forTargetInstance> element is useful for atomic resources that carry installation-specific information. For example, these resources may be stored on a local resource server that resides in a home network.

6.7.4 More examples for <useFor>

This section contains more examples of <useFor> descriptions for atomic resources.

EXAMPLE 1 A label for the volume variable in the socket description of a TV from MyCompany. It applies to English language contexts. Note that it contains no value reference.

```
<useFor rdf:parseType="Collection“>
    <Context>
        <eltRef rdf:resource="http://example.com/tv-2003/socketdescription#volume" />
        <role rdf:resource="http://myurc.org/ns/res#label" />
        <forLang>en</forLang>
    </Context>
</useFor>
```

EXAMPLE 2 Consider an online travel service (version 1.0) from TravelCompany. A simple help text atomic resource (role is "help/purpose") that is specific to the socket variable 'airport', and the value "ORD is shown below. It can be used in any language context, hence an empty <forLang> element is specified.

```
<useFor rdf:parseType="Collection“>
    <Context>
        <eltRef rdf:resource="http://www.travelcompany.com/online/1.0/socketdescr#airport" />
        <valRef>ORD</valRef>
        <role rdf:resource="http://myurc.org/ns/res#help-purpose" />
        <forLang />
    </Context>
</useFor>
```

EXAMPLE 3 A French label for the Model-2000 elevator of the company "LiftMaker". This atomic resource references a target description's element with id "elevatorTarget". No value reference is given.

```
<useFor rdf:parseType="Collection“>
    <Context>
        <eltRef rdf:resource="http://www.liftmaker.com/model-2000/td#elevatorTarget" />
        <role rdf:resource="http://myurc.org/ns/res#label" />
        <forLang>fr</forLang>
    </Context>
</useFor>
```

EXAMPLE 4 An English label is provided for increasing the socket variable that specifies the volume for a radio. This label could be used to label a small "louder" button as part of a volume slider (the "louder" button would be part of the UI rendering of the range interactor and not explicitly specified in a presentation template). Or it could be used to facilitate a simple natural language command to increase the volume.

```
<AResDesc rdf:about="http://example.com/radio/rsheet.rdf#volume_incr_label">
    <content rdf:parseType="Literal" xml:lang="en">louder</content>
    <useFor rdf:parseType="Collection“>
        <Context>
            <eltRef rdf:resource="http://example.com/radio/socket#volume" />
            <role rdf:resource="http://myurc.org/ns/res#label" />
            <opRef rdf:resource="http://myurc.org/ns/res#up" />
            <forLang>en</forLang>
        </Context>
    </useFor>
</AResDesc>
```

EXAMPLE 5 An English target location description is provided for an electronic building directory (target device instance) that has been installed in a public building.

```
<AResDesc rdf:about="http://example.com/directory/rsheet.rdf#location">
    <content rdf:parseType="Literal" xml:lang="en">In the North-East corner of the lobby</content>
    <useFor rdf:parseType="Collection“>
        <Context>
            <eltRef rdf:resource="http://example.com/directory#target" />
            <role rdf:resource="http://myurc.org/ns/res#location" />
            <forLang>en</forLang>
            <forTargetInstance> AB-3D-7F-3E </forTargetInstance>
        </Context>
    </useFor>
</AResDesc>
```


6.8 The <dc:creator> element

<dc:creator> specifies a creator for an atomic resource, i.e. an entity primarily responsible for making the content of the atomic resource (e.g. a person, an organization, or a service).

EXAMPLE 1 <dc:creator>MyCorp, Inc.</dc:creator>

<dc:creator> may occur any number of times (i.e. one atomic resource may have multiple creators).

In addition to the <dc:creator> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:creator> elements from the containing resource sheet (see 8.6.9).

The value space of <dc:creator> is any string, typically a name or a URI (as specified in IETF RFC 3986).

NOTE <dc:creator> conforms to the Dublin Core metadata element creator, http://purl.org/dc/elements/1.1/creator.

If used to specify a creator according to a formal identification schema, the 'rdf:dataType' attribute should be used on <dc:creator> to identify a datatype given as URI.

EXAMPLE 2 The following code specifies a creator with code "XYZ", according to the 'schema1' type defined at http://www.manufacturers.com/types:

<dc:creator rdf:datatype="http://www.manufacturers.com/types#schema1"> XYZ </dc:creator>

6.9 The <dc:publisher> element

<dc:publisher> specifies an entity that makes the atomic resource available (e.g. a person, an organization, or a service).

EXAMPLE <dc:publisher>MyCorp, Inc.</dc:publisher>

<dc:publisher> may occur any number of times (i.e. one atomic resource may have multiple publishers).

In addition to the <dc:publisher> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:publisher> elements from the containing resource sheet (see 8.6.9).

The value space of <dc:publisher> is any string, typically a name or a URI (as specified in IETF RFC 3986).

NOTE <dc:publisher> conforms to the Dublin Core metadata element publisher, http://purl.org/dc/elements/1.1/publisher.

If used to specify a publisher according to a formal identification schema, the 'rdf:dataType' attribute should be used on <dc:publisher> to identify a datatype given as URI.

6.10 The <dc:contributor> element

<dc:contributor> specifies a contributor to the content of an atomic resource (e.g. a person, an organization, or a service).

EXAMPLE <dc:contributor>MyCorp, Inc.</dc:contributor>

<dc:contributor> may occur any number of times (i.e. one atomic resource may have multiple contributors).

In addition to the <dc:contributor> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:contributor> elements from the containing resource sheet (see 8.6.9).

The value space of <dc:contributor> is any string, typically a name or a URI (as specified in IETF RFC 3986).

NOTE contributor conforms to the Dublin Core metadata element contributor, http://purl.org/dc/elements/1.1/contributor.

If used to specify a contributor according to a formal identification schema, the 'rdf:dataType' attribute should be used on <dc:contributor> to identify a datatype given as URI.

6.11 The <dc:date> element

<dc:date> specifies a date associated with an event in the life cycle of the atomic resource, in the format YYYY-MM-DD (according to ISO 8601). Typically, <dc:date> specifies the creation or availability of the atomic resource.

<dc:date> may occur any number of times.

In addition to the <dc:date> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:date> elements from the containing resource sheet (see 8.6.9).

EXAMPLE <dc:date>2003-05-23</dc:date>

NOTE <dc:date> conforms to the Dublin Core metadata element date, http://purl.org/dc/elements/1.1/date.

6.12 The <dc:rights> element

<dc:rights> specifies copyright and other Digital Copyright Management (DCM) related terms of use, as a text string (no formal syntax required).

<dc:rights> may occur any number of times.

In addition to the <dc:rights> elements specified within <AResDesc>, an atomic resource shall inherit all <dc:rights> elements from the containing resource sheet (see 8.6.9).

EXAMPLE <dc:rights>Copyright 2003 by MyCorp, Inc. All rights reserved.</dc:rights>

NOTE rights conforms to the Dublin Core metadata element rights, http://purl.org/dc/elements/1.1/rights.

If used to specify a rights according to a formal identification schema, the 'rdf:dataType' attribute should be used on <dc:rights> to identify a datatype given as URI.

6.13 The <dcterms:audience> element

<dcterms:audience> specifies a class of entity for whom the atomic resource is intended or useful. It may contain any string value (no formal syntax required).

<dcterms:audience> may occur any number of times.

In addition to the <dcterms:audience> elements specified within <AResDesc>, an atomic resource shall inherit all <dcterms:audience> elements from the containing resource sheet (see 8.6.9).

EXAMPLE <dcterms:audience>K-2</dcterms:audience>

A class of entity may be determined by the creator or the publisher or by a third party. This may be used in two ways: to identify a class of users or a class of URCs that may use this atomic resource. This Standard does not define or restrict the use of this property. Future releases of the Standard may, however, define a vocabulary that may be used to describe an audience property of relevance to consumers of atomic resources.

NOTE <dcterms:audience> conforms to the Dublin Core metadata element audience, http://purl.org/dc/terms/audience.

If used to specify a audience according to a formal identification schema, the 'rdf:dataType' attribute should be used on <dcterms:audience> to identify a datatype given as URI.

6.14 The <dcterms:hasVersion> element

<dcterms:hasVersion> references a version, edition, abbreviation, summarization, or any adaptation of the described atomic resource. The referenced atomic resource is specified as the value of the 'rdf:resource' attribute, which shall be a URI (as specified in IETF RFC 3986).

<dcterms:hasVersion> may occur any number of times.

In addition to the <dcterms:hasVersion> elements specified within <AResDesc>, an atomic resource shall inherit all <dcterms:hasVersion> elements from the containing resource sheet (see 8.6.9).

EXAMPLE
<dcterms:hasVersion rdf:resource="http://example.com/thermometer/anotherRsheet#temp_label_version" />

NOTE <dcterms:hasVersion> conforms to the Dublin Core metadata element refinement hasVersion, http://purl.org/dc/terms/hasVersion which is a refinement of http://purl/org/dc/elements/1.1/relation.

Changing an atomic resource description should lead to a changed identifier (URI). The <dcterms:hasVersion> is a way to express the relation between the original and the derived atomic resource description.

6.15 The <dcterms:isVersionOf> element

<dcterms:isVersionOf> references an atomic resource that the described atomic resource is a version, edition or any adaptation of. The referenced atomic resource is specified as the value of the 'rdf:resource' attribute, which shall be a URI (as specified in IETF RFC 3986).

<dcterms:isVersionOf> may occur any number of times.

In addition to the <dcterms:isVersionOf> elements specified within <AResDesc>, an atomic resource shall inherit all <dcterms:isVersionOf> elements from the containing resource sheet (see 8.6.9).

EXAMPLE <dcterms:isVersionOf rdf:resource="http://example.com/thermometer/anotherRsheet#temp_label " />

NOTE <dcterms:isVersionOf> conforms to the Dublin Core metadata element isVersionOf, http://purl.org/dc/terms/isVersionOf which is a refinement of http://purl.org/dc/element/1.1/relation.

Changing an atomic resource description should lead to a changed identifier (URI). The <dcterms:isVersionOf> is a way to express the relation between the derived and the original atomic resource description.

6.16 The <dcterms:isReplacedBy> element

<dcterms:isReplacedBy> specifies an atomic resource that supplants, displaces, or supersedes the described atomic resource. The referenced atomic resource is specified as the value of the 'rdf:resource' attribute, which shall be a URI (as specified in IETF RFC 3986).

<dcterms:isReplacedBy> may occur any number of times.

In addition to the <dcterms:isReplacedBy> elements specified within <AResDesc>, an atomic resource shall inherit all <dcterms:isReplacedBy> elements from the containing resource sheet (see 8.6.9).

EXAMPLE
<dcterms:isReplacedBy rdf:resource="http://example.com/thermometer/anotherRsheet#temp_label_repl" />

NOTE 1 <dcterms:isReplacedBy> conforms to the Dublin Core metadata element refinement isReplacedBy, http://purl.org/dc/terms/isReplacedBy which is a refinement of http://purl/org/dc/elements/1.1/relation.

NOTE 2 The <dcterms:isReplacedBy> is a way to express that an atomic resource description is obsolete, and that its identified replacement should be used instead.

6.17 The <dcterms:replaces> element

<dcterms:replaces> specifies that the described atomic resource supplants, displaces, or supersedes the referenced atomic resource. This means that the described atomic resource may be used instead of the referenced atomic resource, in any use context specified by the referenced atomic resource. The referenced atomic resource is specified as the value of the 'rdf:resource' attribute, which shall be a URI (as specified in IETF RFC 3986).

<dcterms:replaces> may occur any number of times.

In addition to the <dcterms:replaces> elements specified within <AResDesc>, an atomic resource shall inherit all <dcterms:replaces> elements from the containing resource sheet (see 8.6.9).

EXAMPLE 1 <dcterms:isReplacedBy rdf:resource="http://example.com/thermometer/rsheet#temp_label" />

NOTE <dcterms:replaces> conforms to the Dublin Core metadata element refinement isReplacedBy, http://purl.org/dc/terms/replaces which is a refinement of http://purl/org/dc/elements/1.1/relation.

The <dcterms:replaces> can be used if an atomic resource description is created to replace an obsolete one.

EXAMPLE 2 A possible use case for the <dcterms:isReplacedBy> and <dcterms:replaces> elements is a target manufacturer wanting to replace an erroneous resource (and its description) that is hard-coded in a target, by a resource that is available through the target manufacturer's resource service. The old (hard-coded) resource would be tagged with a <dcterms:isReplacedBy> element, and the new one (in the resource service) with <dcterms:replaces>.

6.18 Other elements from DCMI

Additionally any element and element refinement from the Dublin Core Metadata Initiative (DCMI) Metadata Terms document (see ISO 15836:2003) may be used to describe an atomic resource, if appropriate. Each of them may occur multiple times within an atomic resource description.

In addition to the DCMI elements specified within <AResDesc>, an atomic resource shall inherit all DCMI elements from the containing resource sheet (see 8.6.9).

For any of these elements, the 'rdf:dataType' attribute may be used to identify a datatype (given as URI) used for the coding of the contained literal.

7 Grouping resource – <Grouping>

7.1 General

A grouping resource specifies a presentational structure of user interface socket elements or UIID elements in a top-down fashion that is external to a socket description. In a grouping resource individual subgroups and user interface elements may occur multiple times (in different parent groups).

A grouping resource is a resource.

A grouping resource is described in the XML format, coded in UCS according to ISO/IEC 10646. It is specified by the <Grouping> element which may occur one or multiple times in a resource sheet (see 8). A group in one resource sheet may reference another group in the same or in a different resource sheet as its subgroup.

NOTE ISO/IEC 24752-1 requires at least one grouping resource per socket, containing references to all of its elements that are supposed to be shown to the user, but no references to elements of other sockets or UIIDs.

EXAMPLE A grouping resource for the UI socket description of a digital thermometer (see Annex D) could look like the code listed below. The main group contains the temperature and scale element, and references a subgroup with the maximum and minimum values and the command to reset them. The commands confirmReset and cancelReset are

contained in a separate group that is bound to the ‘checkReset’ notify element. Note that the constant ‘modelNumber’ has not been included since its ‘relevant’ dependency is “false()”, i.e. it is not supposed to be shown to the user.

```
<Grouping rdf:about="http://example.com/thermometer/rsheet.rdf#grouping">
    <groupingForDomain rdf:resource=”http://example.com/thermometer/socket” />
    <mainGroup rdf:resource="http://example.com/thermometer/rsheet.rdf#mainGroup“ />
    <modalGroup rdf:resource="http://example.com/thermometer/rsheet.rdf#resetNotifyGroup“ />
    <groups rdf:parseType=”Collection”>
        <Group rdf:about="http://example.com/thermometer/rsheet.rdf#mainGroup">
            <cohesion>weak</cohesion>
            <eltRef rdf:resource="http://example.com/thermometer/socket#temperature“ />
            <eltRef rdf:resource="http://example.com/thermometer/socket#scale“ />
            <groupRef rdf:resource="http://example.com/thermometer/rsheet.rdf#maxMinGroup" />
        </Group>
        <Group rdf:about="http://example.com/thermometer/rsheet.rdf#maxMinGroup">
            <cohesion>normal</cohesion>
            <eltRef rdf:resource="http://example.com/thermometer/socket#maximum“ />
            <eltRef rdf:resource="http://example.com/thermometer/socket#minimum“ />
            <eltRef rdf:resource="http://example.com/thermometer/socket#reset“ />
        </Group>
        <Group rdf:about="http://example.com/thermometer/rsheet.rdf#resetNotifyGroup">
            <forNotify rdf:resource=“http://example.com/thermometer/socket#checkReset“ />
            <cohesion>strong</cohesion>
            <eltRef rdf:resource="http://example.com/thermometer/socket#confirmReset“ />
            <eltRef rdf:resource="http://example.com/thermometer/socket#cancelReset“ />
        </Group>
    </groups>
</Grouping>
```

7.2 The ‘rdf:about’ attribute

The ‘rdf:about’ attribute specifies an unambiguous identifier of a grouping resource. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, as specified in IETF RFC 3986), including a trailing fragment identifier.

The URI may or may not be resolvable.

NOTE 1 Target manufacturers and resource providers are encouraged to make grouping resources publicly available by posting the grouping resource at the URI specified by the ‘rdf:about’ attribute.

The ‘rdf:about’ attribute may be present. If it is not present, the pertaining grouping resource is called “anonymous grouping resource”.

NOTE 2 A good practice is to use as identifier the identifier (URI) of the resource sheet that contains the grouping resource, followed by a hash sign '#', followed by a fragment identifier that is unique within the resource sheet (see example above).

A grouping resource should be stable as much as possible. If a grouping resource needs to be changed after it was made available to URCs or resource services, its identifier (‘rdf:about’ attribute) should be changed as well.

NOTE 3 The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

7.3 The <groupingForDomain> element

The <groupingForDomain> element shall occur one or multiple times in a grouping resource. It is used to specify the domain(s) of the user interface elements that occur as the leaves of the group tree described by the grouping resource.

In addition to the <groupingForDomain> elements specified within <Grouping>, a grouping resource shall inherit all <groupingForDomain> elements from its containing resource sheet (see 8.6.8).

EXAMPLE 1 The following code specifies that the grouping resource references elements of the socket http://example.com/bigapplication/socket:

```
<groupingForDomain rdf:resource="http://example.com/bigapplication/socket" />
```

EXAMPLE 2 The following code specifies that the grouping resource references elements from two different sockets (http://example.com/bigapplication/socket and http://example.com/anotherapplication/socket):

```
<groupingForDomain rdf:resource="http://example.com/bigapplication/socket" />
<groupingForDomain rdf:resource="http://example.com/anotherapplication/socket" />
```

<groupingForDomain> shall have exactly one attribute rdf:resource. The value of the 'rdf:resource' attribute references a UI socket or UIID by its name (URI without fragment identifier '#', as specified in IETF RFC 3986).

7.4 The <forLang> element

<forLang> describes the general language context in which the grouping resource can be applied. <forLang> shall contain a language identifier as text content, or be empty. The format and coding schema of the language identifier is the same as for the 'xml:lang' attribute (see 6.3.5.2). In addition, an empty <forLang> element indicates that the grouping resource is language-independent.

<forLang> may be present and may occur multiple times within a <Grouping> element. If specified multiple times with different values (language identifiers), the grouping resource can be applied in multiple language contexts.

In addition to the <forLang> elements specified within <Grouping>, a grouping resource shall inherit all <forLang> elements from its containing resource sheet (see 8.6.2).

EXAMPLE A grouping resource intended to be used as part of an English user interface could be specified as:
<forLang>en</forLang>

NOTE The values of <forLang> can be used as "language scents" in resource sheets (see 8.6.2) and resource directories (see 11.5.2).

7.5 The <mainGroup> element

The <mainGroup> element shall occur exactly once as child element of <Grouping>. It specifies the main (i.e. all encompassing) group for the described grouping resource.

The main group is referenced by its URI (as specified in IETF RFC 3986) which is coded as the value of an 'rdf:resource' attribute which shall occur once.

NOTE The group referenced as main group can be internal (i.e. defined inside the same <Grouping> element or external (i.e. defined in a different <Grouping> element which may or may not be in the same file).

7.6 The <modalGroup> element

The <modalGroup> element may occur any number of times as child element of <Grouping>. It specifies a group to be used as a modal dialog, triggered by a specified socket notification.

The modal dialog group is referenced by its URI (as specified in IETF RFC 3986) which is coded as the value of an 'rdf:resource' attribute which shall occur once.

NOTE 1 The group referenced as modal dialog group can be internal (i.e. defined inside the same <Grouping> element or external (i.e. defined in a different <Grouping> element which may or may not be in the same file).

NOTE 2 Typically, a group that is used as modal dialog would not be referenced from the main dialog or any of its descendants, but this is not a requirement.

7.7 The <groups> element

The <groups> element may occur once as subelement of <Grouping>. If present, it shall contain a set of one or more <Group> elements.

7.7.1 The 'rdf:parseType' attribute

The <groups> element shall have an 'rdf:parseType' attribute with value "Collection".

NOTE The 'rdf:parseType' attribute is necessary to conform to RDF/XML syntax rules, see RDF/XML Syntax Specification (Revised), section 2.16.

7.7.2 The <Group> element

The <Group> element may occur one or more times as subelement of <groups>. If present, it defines a group with a specified identifier.

The identifier (URI, as specified in IETF RFC 3986) of the group shall be coded as the value of the 'rdf:resource' attribute which shall occur exactly once. The URI shall be globally unique.

NOTE 1 A group can be referenced by its URI from <mainGroup> or <groupRef> elements which may be part of the same or other <Grouping> elements.

The order of <groupRef> (see 7.7.2.3) and <eltRef> (see 7.7.2.4) elements occurring within the same <Group> element is significant.

EXAMPLE The order of the <groupRef> and <eltRef> elements may be used for navigation, for example when a user presses the TAB key to traverse through a hierarchy of groups and elements in linear order.

NOTE 2 The grouping resource does not contain explicit information on linear navigation, such as provided by the tabindex attribute of XForms. When linear navigation is provided to the user, implementers are encouraged to traverse the tree of groups and elements in a depth-first manner, following the order of the <groupRef>, <eltRef> and <setRef> elements under the same <Group> element.

NOTE 3 ISO/IEC 24752-1 requires that label resources be provided for all <Group> elements of the one required grouping resource per socket.

NOTE 4 The structure of the presentational groups and their number of entries is an important aspect of user interface design, and should be chosen carefully. While user interface design is out of scope for this International Standard, a menu size of 5-7 elements has been found to be suitable for many use situations.

7.7.2.1 The 'rdf:about' attribute

The 'rdf:about' attribute shall be present. It specifies an unambiguous identifier for a group. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, see IETF RFC 3986), including a trailing fragment identifier.

The URI may or may not be resolvable.

NOTE A good practice is to use as identifier the identifier (URI) of the grouping resource that contains the group, followed by a hash sign '#', followed by a fragment identifier that is unique within the grouping resource.

7.7.2.2 The <cohesion> element

The <cohesion> element shall occur exactly once as subelement of <Group>.

It specifies the level of cohesion of the group, i.e. how strongly the group's elements cohere to each other relative to their coherence to the siblings of the group. The siblings are determined by following the hierarchical structure of the pertinent <Grouping> element in a top-down fashion; siblings are all other <Group> elements that are referenced by <groupRef> from the parent of the group.

The cohesion level shall be coded as element content. Valid cohesion levels are "strong", "normal" or "weak", with the following interpretations:

“strong”: Very strong cohesion, to the exclusion of all other groups. In other words, when dealing with this group, the user probably does not need to access other groups at all. It is recommended to use the group label when presenting this group. It is also recommended that only this group be included in a presentation, though a navigation route to reach the other available parts of the presentation shall be available.

“normal”: This is a group of items that fit logically together. It is recommended to use the group label when presenting this group.

“weak”: These items can be grouped together but need not be explicitly identified as a group.

The default value is “normal”.

7.7.2.3 The <groupRef> element

The <groupRef> element may occur one or multiple times as subelement of <Group>. It references a group to be used as subgroup of the described group. Thus multiple levels of groups can be defined in grouping resources.

<groupRef> shall have exactly one attribute rdf:resource. The value of the ‘rdf:resource’ attribute references a subgroup by its identifier (as given by the value of the subgroup’s ‘rdf:about’ attribute).

Loops in the grouping resource are not permitted, i.e. a group shall not reference itself nor any of its ancestor groups as subgroup.

NOTE This does not rule out that one group can have multiple parent groups, see 7.1.

7.7.2.4 The <eltRef> element

The <eltRef> element may occur one or multiple times as subelement of <Group>. It references a socket element (variable, constant or command) to be used as an element of the described group.

NOTE 1 Socket elements are the leaves of the grouping tree, as described by a grouping resource.

<eltRef> shall have exactly one attribute rdf:resource. The value of the ‘rdf:resource’ attribute references a socket element or UIID element by its identifier (URI, see IETF RFC 3986).

A <Group> element shall not have multiple <eltRef> elements with the same ‘rdf:resource’ value, i.e. one element shall not be referenced multiple times from the same group.

NOTE 2 This does not rule out that one element can be contained in multiple groups, see 7.1.

7.7.2.5 The <setRef> element

The <setRef> element may occur one or multiple times as subelement of <Group>. It references a set in a socket description. All variable, constant and command elements (notifications are exempt) that are direct members of the referenced set shall be used as elements of the described group. Subsets of the referenced set and their members shall not be included in the described group.

NOTE 1 The group may add other elements not contained in the referenced set(s), by using the <eltRef> element.

<setRef> shall have exactly one attribute rdf:resource. The value of the ‘rdf:resource’ attribute references a <set> element of a socket description by its identifier (URI, see IETF RFC 3986).

A <Group> element shall not have multiple <setRef> elements with the same ‘rdf:resource’ value, i.e. one set shall not be referenced multiple times from the same group.

NOTE 2 This does not rule out that one set can be referenced from multiple groups, see 7.1.

7.7.2.6 The <forNotify> element

The <forNotify> element may occur inside a <Group> element. More specifically, it shall occur one or more times if the containing Group is used in a modal fashion, i.e. is referenced by a <modalGroup> element (see 7.6). Otherwise it shall not occur.

The <forNotify> element specifies a socket notification element that the modal group is bound to, i.e. that triggers the presentation of the modal group. Multiple notify elements may trigger the presentation of one group.

The notify element reference is specified as value of the attribute 'rdf:resource' which shall be present. Its format is a URI (see IETF RFC 3986), followed by a pound sign '#' and a trailing fragment identifier.

NOTE 1 This syntax follows the common way of concatenating URIs with fragment identifiers, and is compatible with the XPointer framework.

NOTE 2 Making <forNotify> a subelement of <Group> does not restrict the re-usability of a Group definition. For example, one could re-use a Group definition in an external grouping resource definition by extending the external Group definition by the <forNotify> element, as shown in the following code fragment:

```
<Grouping rdf:about="http://example.com/thermometer/rsheet.rdf#grouping">
        <groupingForDomain rdf:resource="http://example.com/thermometer/socket" />
        <mainGroup rdf:resource="http://example.com/thermometer/rsheet.rdf#mainGroup" />
        <modalGroup rdf:resource="http://example.com/thermometer/anotherrsheet.rdf#resetNotifyGroup" />
        <groups rdf:parseType="Collection">
            …
            <!-- Extending an external Group definition by a forNotify element -->
            <Group rdf:about="http://example.com/thermometer/anotherrsheet.rdf#resetNotifyGroup">
                <forNotify rdf:resource="http://example.com/thermometer/socket#checkReset" />
            </Group>
        </groups>
</Grouping>
```

7.8 Elements from DCMI

Any element and element refinement from the Dublin Core Metadata Initiative (DCMI) Metadata Terms document (see ISO 15836:2003) may be used to annotate a grouping resource, if appropriate. Each of them may occur multiple times within a grouping resource.

In addition to the DCMI elements specified within <Grouping>, a grouping resource shall inherit all DCMI elements from its containing resource sheet (see 8.6.9).

For any of these elements, the 'rdf:dataType' attribute may be used to identify a datatype (given as URI) used for the coding of the contained literal.

NOTE Grouping resources can contain DCMI properties in the same way as atomic resource descriptions can. See 6.8 through 6.18 for examples.

8 Resource sheet – <ResSheet>

8.1 General

A resource sheet is a file that contains atomic resource descriptions. These atomic resource descriptions are typically describing atomic resources of a particular domain, language, or type, or a combination of these. However, this structure is not required by the International Standard.

A resource sheet may be provided by a target (referenced from its target description), or by any resource service.

A resource sheet is written in the XML format, coded in UCS according to ISO/IEC 10646. It is specified by the <ResSheet> element. The <ResSheet> element is of the namespace http://myurc.org/ns/res#. The namespace identifier 'res' should be used in resource sheets, or this namespace should be made the default namespace (as in the example below).

The <ResSheet> element can occur in two different ways: either one or multiple times inside a resource directory (see section 11) or as the single root element in a separate file (the “resource sheet file”). If used inside a resource directory, it may contain an "include reference" (see 8.5) to an external resource sheet file. An external resource sheet shall not contain an "include reference" to another external resource sheet file.

NOTE Technically, the contents of the <ResSheet> element in the resource directory, and contents of the <ResSheet> element in the referenced external file are to be merged, if their rdf:about (see section 8.2) attributes have the same values.

Some of the properties of atomic resources can be applied to a resource sheet directly, e.g. <dc:publisher>. Others are providing cues ("scents") as to what kind of atomic resources are contained in the resource sheet.

However, in any case the properties of the resource sheet are not automatically inherited by the contained atomic resources. This means that the atomic resources have to specify their property values even if they are already specified by the containing resource sheet.

EXAMPLE The following is a shortened example of a resource sheet for an electronic thermometer, containing a label and a help text for temperature. For informative purposes, the full example is included as Annex C. As typical, namespace identifiers are defined within the <ResSheet> element.

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Note: This document should be served with a MIME type of “application/urc-ressheet+xml”, if applicable -->

<ResSheet
    rdf:about="http://example.com/thermometer/rsheet.rdf"
    xmlns="http://myurc.org/ns/res#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

    <dcterms:conformsTo>http://myurc.org/iso24752-5/2007</dcterms:conformsTo>
    <dc:type>Text</dc:type>
    <dc:format>text/xml</dc:format>
    <dc:publisher>MyCorp, Inc.</dc:publisher>
    <dc:title xml:lang="en">Resource sheet for a digital thermometer</dc:title>
    <dcterms:modified>2007-08-20</dcterms:modified>
    <aResDescForDomain rdf:resource="http://example.com/thermometer/socket"/>
    <groupingForDomain rdf:resource="http://example.com/thermometer/socket"/>
    <forLang>en</forLang>

    <!-- Description of the contained atomic resources -->

    <resItems rdf:parseType=”Collection”>
        <AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#temperature_label">
            <content rdf:parseType="Literal" xml:lang="en">Temperature</content>
            <useFor rdf:parseType="Collection">
                <Context>
                    <eltRef rdf:resource="http://example.com/thermometer/socket#temperature"/>
                    <role rdf:resource="http://myurc.org/ns/res#label"/>
                </Context>
            </useFor>
        </AResDesc>
        <AResDesc rdf:about="http://example.com/thermometer/rsheet.rdf#temperature_help_hint">
            <content rdf:parseType="Literal" xml:lang="en">Current temperature</content>
            <useFor rdf:parseType="Collection">
                <Context>
                    <eltRef rdf:resource="http://example.com/thermometer/socket#temperature"/>
                    <role rdf:resource="http://myurc.org/ns/res#help-purpose"/>
```

```
                </Context>
            </useFor>
        </AResDesc>
    </resItems>

    <!-- More resource descriptions -->

</ResSheet>
```

The following subsections specify the attributes and subelements of the <ResSheet> element.

8.2 The ‘rdf:about’ attribute

The ‘rdf:about’ attribute specifies an unambiguous identifier of a resource sheet. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, as specified in IETF RFC 3986), with no fragment identifier appended.

This URI may or may not be resolvable.

NOTE 1 Target manufacturers and resource providers are encouraged to make resource sheets publicly available by posting the resource sheet at the URI specified by the ‘rdf:about’ attribute.

The ‘rdf:about’ attribute may be present. If it is not present, the pertaining resource sheet is called "anonymous resource sheet".

NOTE 2 Use the <localAt> element to specify URIs that are specific to a local network environment.

NOTE 3 The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

8.3 The <dcterms:modified> element

The <dcterms:modified> element contains a modification date of the resource sheet. It indicates that the resource sheet has been modified from its original version, but still uses the same identifier (‘rdf:about’ attribute, see section 8.2). Its content is of type xsd:date or xsd:dateTime.

EXAMPLE <dcterms:modified>2003-12-30</dcterms:modified>

<dcterms:modified> may be present. However, it is strongly recommended to be used inside resource sheets that were changed after deployment.

The <dcterms:modified> element may or may not occur as a "scent" in a <ResSheet> element that is used as a reference to a resource sheet, even if the referenced resource sheet has the <dcterms:modified> element included.

NOTE <dcterms:modified> conforms to the Dublin Core metadata element refinement modified, http://purl.org/dc/terms/modified.

A resource sheet should remain stable as much as possible once it has been made available to URCs or resource services. A resource sheet that has already been deployed may be changed only if its identifier (‘rdf:about’ attribute) or its modification date is changed. If a resource sheet has multiple versions with the same identifier (but different modification dates), changed atomic resource descriptions inside should have a new identifier assigned.

8.4 The <dcterms:conformsTo> element

The <dcterms:conformsTo> element specifies a reference to an established standard to which the resource sheet and its contents (atomic resource descriptions and grouping resources) conforms. The value, a URI (as specified in IETF RFC 3986), is provided as text content of the element. The value "http://myurc.org/iso24752-5/2007" indicates that the described resource sheet conforms to this International Standard.

EXAMPLE <dcterms:conformsTo>http://myurc.org/iso24752-5/2007<dcterms:conformsTo/>

<dcterms:conformsTo> shall be present and may appear multiple times (this is for compatibility with future versions of this International Standard).

NOTE 1 The <dcterms:conformsTo> element is only specified on the resource sheet level. Atomic resource descriptions and grouping resources automatically inherit the conformance claim of their containing resource sheet.

NOTE 2 The value of the <dcterms:conformsTo> element can be used when testing for conformance of a resource sheet.

NOTE 3 <dcterms:conformsTo> conforms to the Dublin Core metadata element refinement conformsTo, http://purl.org/dc/terms/conformsTo which is a refinement of the Dublin Core element http://purl.org/dc/elements/1.1/relation.

8.5 The <localAt> element

The <localAt> element provides an "include reference" to an external resource sheet file. <localAt> specifies a URI (as specified in IETF RFC 3986) that can be used to retrieve a local copy of the described resource sheet. The URI is given as element content.

The URI may be relative, in which case it is based on a URI base that is explicitly provided by the target in a platform-specific way, or based on the URI of the containing document.

EXAMPLE <localAt>rsheet.rdf</localAt>

<localAt> shall be present once if its parent <ResSheet> element has no <resItems> elements and is contained in a resource directory; otherwise it shall not be present at all. <localAt> shall not be used inside an external resource sheet file.

NOTE 1 This means that a <ResSheet> element inside a resource directory may either contain the atomic resource descriptions or provide a reference to an external resource sheet. An external resource sheet file shall contain atomic resource descriptions and shall not reference another resource sheet through the <localAt> element.

NOTE 2: When used in a target description (TD), relative URIs keep the TD clean of dependencies on a particular networking platform and transport mechanism for retrieving the documents. The only part that has to be platform specific is the fetch mechanism (URI) for the TD. The TD is described in ISO/IEC 24752-4.

NOTE 3: The <localAt> element is meaningful only in a local network environment. This element (with its value) is an exception to the general RDF principle that separate statements on the same resource (with the same identifier) can be merged and are valid on a global scale.

8.6 Scents for resource sheets

8.6.1 General

“Scents” may be provided as subelements of <ResSheet>, to give hints as to what the resource sheet contains. A scent shall only be used for a resource sheet if this scent applies for all items in the resource sheet. Markup for scents is the same as the markup for the corresponding item properties.

Whenever there is a scent that distinguishes a <ResSheet> element from its sibling elements in a resource directory tree (see 11), this scent should be used for the < ResSheet> element.

The scents for resource sheets provide hints to different types of content as follows:

- For contained atomic resources, <forLang> (see 8.6.2), <dcterms:audience> (8.6.3), <dc:type> (8.6.4), <dc:format> (8.6.5), <aResDescForDomain> (8.6.6) and <role> (8.6.7) applies, as well as relevant Dublin Core elements (8.6.9).

- For contained grouping resources, <forLang> (see 8.6.2), <dcterms:audience> (8.6.3) and <groupingForDomain> (8.6.8) applies, as well as relevant Dublin Core elements (8.6.9).

8.6.2 The <forLang> element

A <forLang> element specifies a language that is used in every use context of every atomic resource description and that is assigned to all grouping resources contained in the resource sheet described. Atomic resource descriptions and grouping resources specify their language context by the <forLang> elements (see 6.7.3.5 and 7.4).

<forLang> may occur any number of times.

The value space for <forLang> is the same as for <forLang> of atomic resources and grouping resources (see 6.7.3.5 and 7.4).

EXAMPLE <forLang>en</forLang>

NOTE 1 An empty <forLang> element indicates that all atomic resources and grouping resources in the resource sheet are language-independent.

NOTE 2 Atomic resource descriptions and grouping resources inherit the <forLang> elements from their containing resource sheet and don't need to specify them again.

8.6.3 The <dcterms:audience> element

The <dcterms:audience> element states that all atomic resources and all grouping resources that are contained in the described resource sheet have the specified audience ascribed to.

<dcterms:audience> may occur any number of times.

The value space is the same as for the <dcterms:audience> element for atomic resource descriptions (see section 6.13).

EXAMPLE <dcterms:audience>K-2</dcterms:audience>

NOTE Atomic resource descriptions and grouping resources inherit the <dcterms:audience> elements from their containing resource sheet and don't need to specify them again.

8.6.4 The <dc:type> element

The <dc:type> element specifies an atomic resource type that applies to all atomic resources that are contained in the described resource sheet.

<dc:type> may occur any number of times.

The value space is the same as for <dc:type> (see 6.5).

EXAMPLE <dc:type>Text</dc:type>

NOTE Atomic resource descriptions inherit the <dc:type> elements from their containing resource sheet and don't need to specify them again.

8.6.5 The <dc:format> element

The <dc:format> element specifies an atomic resource format that applies to all atomic resources that are contained in the described resource sheet.

<dc:format> may be present. If present, it shall occur only once.

The value space is the same as for <dc:format> (see 6.6).

EXAMPLE <dc:format>text/xml</dc:format>

NOTE Atomic resource descriptions inherit the <dc:format> element from their containing resource sheet (if available) and don't need to specify it again.

8.6.6 The <aResDescForDomain> element

The <aResDescForDomain> element specifies a domain (given as URI, as specified in IETF RFC 3986) that is used in every use context for every atomic resource that is contained in the described resource sheet. A domain of an atomic resource is the first part (URI) of the <eltRef> value, referencing a structure (e.g. socket) which an atomic resource applies to (see 6.7.3.1).

<aResDescForDomain> may occur any number of times.

The domain URI is given as value of the 'rdf:resource' attribute which shall be present.

EXAMPLE <aResDescForDomain rdf:resource="http://example.com/thermometer/socket" />

8.6.7 The <role> element

The <role> element specifies a role URI that is used in every use context of every atomic resource that is contained in the described resource sheet.

<role> may occur any number of times.

The value space for <role> is the same as for <role> for use contexts of atomic resources (see 6.7.3.4).

The role URI is given as value of the 'rdf:resource' attribute which shall be present.

EXAMPLE <role rdf:resource="http://myurc.org/ns/res#label" />

NOTE Atomic resource descriptions inherit the <role> elements from their containing resource sheet and don't need to specify them again.

8.6.8 The <groupingForDomain> element

The <groupingForDomain> element specifies a domain that is used in every grouping resource that is contained in the described resource sheet.

<groupingForDomain> may occur any number of times.

An 'rdf:resource' attribute shall be present. Its value is the domain of a contained grouping resource. A domain of a grouping resource is specified by its <groupingForDomain> element (see 7.3).

NOTE Grouping resources inherit the <groupingForDomain> elements from their containing resource sheet and don't need to specify them again.

8.6.9 Elements from DCMI

Additionally any element and element refinement from the Dublin Core Metadata Initiative (DCMI) Metadata Terms document (see ISO 15836:2003) may be used if it applies to every item in a resource sheet. Each of them may occur any number of times as scent for a resource sheet. In particular, the following Dublin Core Metadata Terms may be applied to a resource sheet.

- <dc:creator> (see 6.8)
- <dc:publisher> (see 6.9)
- <dc:contributor> (see 6.10)
- <dc:date> (see 6.11)
- <dc:rights> (see 6.12)

NOTE Atomic resource descriptions and grouping resources inherit the DCMI elements from their containing resource sheet and don't need to specify them again.

8.7 The <resItems> element

The <resItems> element shall occur once as subelement of <ResSheet> if <ResSheet> has no <localAt> elements. Otherwise it shall not occur.

8.7.1 The 'rdf:parseType' attribute

The <resItems> element shall have an 'rdf:parseType' attribute with value "Collection".

NOTE The 'rdf:parseType' attribute is necessary to conform to RDF/XML syntax rules, see RDF/XML Syntax Specification (Revised), section 2.16.

8.7.2 Subelements of <resItems>

The <resItems> element shall contain one or more of the following elements as subelements: <AResDesc> (see 6), <Grouping> (see 7).

NOTE This means that a <ResSheet> element inside a resource directory may either contain resource descriptions (atomic resource descriptions and/or grouping resources) via the <resItems> element or provide a reference to an external resource sheet via the <localAt> element.

8.8 MIME type

A resource sheet file shall have a MIME type of "application/urc-ressheet+xml", if applicable (as specified in IETF RFC 2046).

9 UIID description – <UiidDesc>

9.1 General

A UIID description is a collection of properties pertaining to a user interface implementation description (UIID). A UIID description provides "scents" of a UIID that is referenced as an external file.

NOTE UIIDs are instances of a broad range of file formats, some of which may be proprietary. One particular UIID, defined in ISO/IEC 24752-3, is the presentation template (PreT). Refer to ISO/IEC 24752-1 and ISO/IEC 24752-3 for details.

A UIID description is given in XML format, coded in UCS according to ISO/IEC 10646. A UIID description is specified by a <UiidDesc> element.

EXAMPLE:

```
<UiidDesc rdf:about="http://example.com/thermometer/pret.xml">
    <dcterms:conformsTo>http://myurc.org/iso24752-3/2007</dcterms:conformsTo>
    <forSocket rdf:resource="http://example.com/thermometer/socket" />
    <localAt>pret.xml</localAt>
</UiidDesc>
```

9.2 The 'rdf:about' attribute

The 'rdf:about' attribute specifies an unambiguous identifier of a UIID. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, as specified in IETF RFC 3986), which may include a trailing fragment identifier. The URI may or may not be resolvable.

NOTE 1 Target manufacturers and resource providers are encouraged to make UIID descriptions publicly available by posting the UIID description file at the URI specified by the 'rdf:about' attribute.

For UIIDs that are specified in the presentation template markup language (PreTML) their identifier is specified as value of the name attribute of the <pret> element.

NOTE 2 Use the <localAt> elements to specify URIs that are specific to a local network environment.

The 'rdf:about' attribute shall be present.

NOTE 3 The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

9.3 The <dcterms:modified> element

The <dcterms:modified> element contains a modification date of the UIID. It indicates that the UIID has been modified from its original version, but still uses the same identifier ('rdf:about' attribute, see section 9.2). Its content is of type xsd:date or xsd:dateTime.

EXAMPLE <dcterms:modified>2003-12-30</dcterms:modified>

<dcterms:modified> may be present. If present it shall occur exactly once.

NOTE <dcterms:modified> conforms to the Dublin Core metadata element refinement modified, http://purl.org/dc/terms/modified.

A UIID should remain stable as much as possible once it has been made available to URCs or resource services. A UIID that has already been deployed may be changed only if its identifier ('rdf:about' attribute) or its modification date is changed. If a UIID has multiple versions with the same identifier (but different modification dates), changed elements inside should have a new identifier assigned.

9.4 The <dcterms:conformsTo> element

The <dcterms:conformsTo> element specifies a reference (as URI, as specified in IETF RFC 3986) to an established standard to which the UIID conforms. The URI shall be specified as text content of the element. The value http://myurc.org/iso24752-3/2007 indicates that the described UIID conforms to the rules of a presentation template. Presentation templates are described in ISO/IEC 24752-3.

<dcterms:conformsTo> shall be present.

EXAMPLE <dcterms:conformsTo>http://myurc.org/iso24752-3/2007</dcterms:conformsTo>

NOTE 1 The value of the <dcterms:conformsTo> element can be used when testing for conformance of a UIID.

NOTE 2 <dcterms:conformsTo> conforms to the Dublin Core metadata element refinement conformsTo, http://purl.org/dc/terms/conformsTo which is a refinement of the Dublin Core element http://purl.org/dc/elements/1.1/relation.

9.5 The <forSocket> element

The <forSocket> element specifies a socket (i.e. its name URI) that the described UIID binds to. The URI is given as the value of the attribute 'rdf:resource' which shall be present.

<forSocket> may occur any number of times (if the UIID's elements bind to multiple sockets).

EXAMPLE <forSocket rdf:resource="http://example.com/thermometer/socket" />

The name URI of a socket is specified in the target description of the target. Refer to ISO/IEC 24752-4 for details.

9.6 The <forLang> element

The <forLang> element specifies (as element content) which language context the UIID can be applied to.

EXAMPLE <forLang>en</forLang>

Language contexts shall be coded as for the <forLang> element of atomic resources and grouping resources (see 6.7.3.5 and 7.4).

<forLang> may occur any number of times.

NOTE 1 Oftentimes UIIDs will be defined in a language independent way. For example, the presentation template markup language (PreTML) defines a mechanism to tie in external resources that are chosen at runtime to fit the user's language requirements. For these UIIDs an empty <forLang> element should be specified.

NOTE 2 UIIDs don't automatically inherit the <forLang> elements of a UIID description referencing them. Authors will need to specify the <forLang> elements within the UIIDs again.

9.7 The <localAt> element

The <localAt> element specifies a URI (as specified in IETF RFC 3986), given as its content, that can be used to retrieve a local copy of the described UIID.

The URI may be relative, in which case it is based on a URI base that is explicitly provided by the target in a platform-specific way, or based on the URI of the containing document.

EXAMPLE <localAt>pret.xml</localAt>

<localAt> shall be present for UIID descriptions that are contained in target descriptions or in resource directory files that are referenced from a target description.

NOTE 1 When used in a target description (TD), relative URIs keep the TD clean of dependencies on a particular networking platform and transport mechanism for retrieving the documents. The only part that has to be platform specific is the fetch mechanism (URI) for the TD. The TD is described in ISO/IEC 24752-4.

NOTE 2 The <localAt> element is meaningful only in a local network environment. This element (with its value) is an exception to the general RDF principle that separate statements on the same resource (with the same identifier) can be merged and are valid on a global scale.

9.8 Elements from DCMI

Additionally any element and element refinement from Dublin Core Metadata Terms (see ISO 15836:2003) may be used to describe a UIID, if appropriate. Each of them may occur multiple times within a UIID description. In particular, the following Dublin Core Metadata terms may be applied to a UIID:

- <dc:creator> (see section 0)

- <dc:publisher> (see section 6.9)
- <dc:contributor> (see section 6.10)
- <dc:date> (see section 6.11)
- <dc:rights> (see section 6.12)
- <dcterms:audience> (see section 6.13)

NOTE UIIDs don't automatically inherit the DCMI elements of a UIID description referencing them. Authors will need to specify the DCMI elements within the UIIDs again.

10 Resource service description – <ResSvcDesc>

10.1 General

A resource service description is a description of and reference to a resource service that can be queried for any of the following types of resources:

Labels, help texts, keywords, and access keys (as defined by section 6 of this International Standard)

Grouping resources (as defined by section 7 of this International Standard)

Presentation templates (as defined by ISO/IEC 24752-3)

UIIDs in general (format not specified by this International Standard)

A resource service may provide resources from target manufacturers and any 3rd parties, beyond the resources that are provided by a target in its local network environment.

A resource service description is written in XML format, coded in UCS according to ISO/IEC 10646. A resource service description is by a <ResSvcDesc> element.

EXAMPLE The following is an example for a resource service description. The resource service provides supplemental textual English labels for a digital thermometer, and a grouping resource for its socket. It is implemented as a Web service and has an interface description in the Web Service Description Language (WSDL) format which is referenced as http://myurc.org/resservice.wsdl.

```
<ResSvcDesc rdf:about="http://myurc.org/resservice.wsdl">
    <forLang>en</forLang>
    <aResDescForDomain rdf:resource="http://example.com/thermometer/socket"/>
    <dc:type>Text</dc:type>
    <role rdf:resource="http://myurc.org/ns/res#label"/>
</ResSvcDesc>
```

NOTE Resource service descriptions are typically contained in target descriptions to reference sources of supplemental resources for a target (refer to ISO/IEC 24752-4).

10.2 The 'rdf:about' attribute

The 'rdf:about' attribute specifies an unambiguous identifier of a resource service. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, as specified in IETF RFC 3986).

This URI shall be globally resolvable and shall deliver a description file for the resource service.

The 'rdf:about' attribute shall be present.

EXAMPLE 1 <ResSvcDesc rdf:about="http://myurc.org/resservice.wsdl">

The format of an external description file for a resource service is beyond the scope of this Standard. If existing, interface description formats as defined by other standards, may be employed. If standardized, the file extension of the resource service description file and a <dc:format> element inside <ResSvcDesc> (see 10.3.10) may induce its format.

EXAMPLE 2 In example 1 above, the resource service is implemented as a Web service and its description file is named resservice.wsdl, conforming to the Web Service Description Language (WSDL) format.

NOTE The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

10.3 Scents for resource service descriptions

10.3.1 General

"Scents" may be provided as subelements of <ResSvcDesc>, to give hints as to what the resource service provides (directly as immediate content/references or indirectly through provided resource directories, possibly over multiple levels of indirection). If a resource service description has a particular scent, that scent applies to all resources that the resource service provides.

Whenever there is a scent that distinguishes a <ResSvcDesc> element from its sibling elements in a resource directory tree (see 11), this scent should be used for the < ResSvcDesc> element.

The scents for resource service descriptions provide hints to different types of direct and indirect content/provisions as follows:

- For provided atomic resources, <forLang> (see 10.3.2), <dcterms:audience> (10.3.3), <dc:type> (10.3.4), <dc:format> (10.3.5), <aResDescForDomain> (10.3.6) and <role> (10.3.7) applies, as well as relevant Dublin Core elements (10.3.10).

- For provided grouping resources, <forLang> (see 10.3.2), <dcterms:audience> (10.3.3) and <groupingForDomain> (10.3.8) applies, as well as relevant Dublin Core elements (10.3.10).

- For provided UIIDs, <forLang> (see 10.3.2), <dcterms:audience> (10.3.3) and <uiidForDomain> (10.3.9) applies, as well as relevant Dublin Core elements (10.3.10).

NOTE Resource services don't automatically inherit the scent elements of a resource service description referencing them. Authors will need to specify these elements on the resource service again, in a way that a particular resource service requires.

10.3.2 The <forLang> element

The <forLang> element specifies a language that is used in every use context of every atomic resource, for every grouping resource and for every UIID that is provided by the described resource service.

This element may occur any number of times to list all relevant languages.

The value space for the content of the <forLang> element is the same as for the <forLang> elements of atomic resources (see 6.7.3.5), grouping resources (see 7.4) and of UIID descriptions (see 9.6).

NOTE An empty <forLang> element indicates that all atomic resources and grouping resources provided by the resource service are language-independent.

10.3.3 The <dcterms:audience> element

The <dcterms:audience> element specifies an audience that applies to every atomic resource, every grouping resource and every UIID that is provided by the described resource service.

This element may occur any number of times to list all relevant audiences.

The value space for the content of the <dcterms:audience> element is the same as for the <dcterms:audience> element of atomic resources (see 6.13), grouping resources (see 7.8) and of UIID descriptions (see 9.8).

10.3.4 The <dc:type> element

The <dc:type> element specifies a type that applies to every atomic resource that is provided by the described resource service.

This element may occur any number of times to list all relevant types.

The value space for the content of this element is the same as for <dc:type> for atomic resource descriptions (see 6.5).

10.3.5 The <dc:format> element

The <dc:format> element specifies a format that applies to every atomic resource that is provided by the described resource service.

This element may occur any number of times to list all relevant formats.

The value space for the content of this element is the same as for <dc:format> for atomic resource descriptions (see 6.6).

10.3.6 The <aResDescForDomain> element

The <aResDescForDomain> element specifies a domain that is used in every use case of every atomic resource that is provided by the described resource service.

This element may occur any number of times to list all relevant domains.

An ‘rdf:resource’ attribute shall be present. Its value is the URI (as specified in IETF RFC 3986) of the domain of one or more atomic resources that are provided by the resource service. The domain of an atomic resource is the first part (URI without fragment identifier '#') of the <eltRef> value contained in one of the use contexts of an atomic resource (see 6.7.3.1).

10.3.7 The <role> element

The <role> element specifies a role that is used in every use case of every atomic resource that is provided by the described resource service.

This element may occur any number of times to list all relevant roles.

An ‘rdf:resource’ attribute shall be present. Its value is a role URI (see 6.7.3.4) of one or more atomic resources that are provided by the resource service.

10.3.8 The <groupingForDomain> element

The <groupingForDomain> element specifies a domain that applies to every grouping resource that is provided by the described resource service.

This element may occur any number of times to list all relevant domains.

An ‘rdf:resource’ attribute shall be present. Its value is the name URI of the socket or UIID that a provided grouping resource applies to.

10.3.9 The <uiidForDomain> element

The <uiidForDomain> element specifies a domain that applies to every UIID that is provided by the described resource service.

This element may occur any number of times to list all relevant domains.

An ‘rdf:resource’ attribute shall be present. Its value is the name URI of the socket that a provided UIID binds to. This is the same URI as specified in <socketFor> of the pertaining <uiidDesc> element (see 9.5).

10.3.10 Dublin Core elements

Additionally any element and element refinement from the Dublin Core Metadata Initiative (DCMI) Metadata Terms document (see ISO 15836:2003) may be used if it applies to every item delivered by the resource service. They provide "scents" of the resources (including atomic resources, grouping resources and UIIDs) that the resource service provides.

Each of these elements and element refinements may occur multiple times within a resource service description.

11 Resource directory – <ResDir>

11.1 General

A resource directory is a file or part of a file that contains a resource directory referencing available resource sheets and other resources. Resource directories can be used as hierarchical "directories" of resource sheets, facilitating the selection of appropriate resource sheets. Each resource directory provides hereby a "scent" of the properties of the directly or indirectly referenced resource sheets.

The reference structure for resource directories need not be hierarchical, i.e. it need not be a tree structure. In fact, a resource sheet may be referenced from multiple resource directories. However, typically there will be one resource directory serving as the root of a multi-layered directory of resource sheets.

A resource directory is written in XML format, coded in UCS according to ISO/IEC 10646. It is specified by the <ResDir> element.

EXAMPLE 1 The following is an example of a resource directory with identifier http://example.com/thermometer/resdir.rdf. The resource directory contains a reference to a resource sheet, a UIID description, a reference to an external resource service, and a reference to another resource directory.

```
<?xml version="1.0" encoding="UTF-8"?>

<ResDir rdf:about="http://example.com/thermometer/resdir.rdf">
      xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
      xmlns:dc="http://purl.org/dc/elements/1.1/"
      xmlns:dcterms="http://purl.org/dc/terms/"
      xmlns="http://myurc.org/ns/res#">

      <dirItems rdf:parseType=”Collection”>
            <!-- Reference to resource sheet with English text labels for socket. -->
            <ResSheet rdf:about="http://example.com/thermometer/rsheet-en.rdf">
                  <forLang>en</forLang>
                  <dcterms:conformsTo>http://myurc.org/iso24752-5/2007</dcterms:conformsTo>
                  <localAt>rsheet-en.rdf</localAt>
                  <dc:type>Text</dc:type>
                  <aResDescForDomain rdf:resource="http://example.com/thermometer/socket"/>
                  <groupingForDomain rdf:resource="http://example.com/thermometer/socket"/>
            </ResSheet>
```

```
        <!-- Description of a UIID that is a presentation template for the digital thermometer. -->
        <UiidDesc rdf:about="http://example.com/thermometer/pret.xml">
            <dcterms:conformsTo>http://myurc.org/iso24752-5/2007</dcterms:conformsTo>
            <forSocket rdf:resource="http://example.com/thermometer/socket"/>
            <localAt>pret.xml</localAt>
            <dc:publisher>MyCorp, Inc.</dc:publisher>
        </UiidDesc>

        <!-- Description of a resource service that provides text labels for the thermometer's socket. -->
        <ResSvcDesc rdf:about="http://myurc.org/resservice.wsdl">
            <forLang>en</forLang>
            <aResDescForDomain rdf:resource="http://example.com/thermometer/socket"/>
            <dc:type>Text</dc:type>
            <role rdf:resource="http://myurc.org/ns/res#label"/>
        </ResSvcDesc>

        <!-- Reference to another resource directory with references to resource sheets that contains labels, help texts,
access keys, and keywords for the socket in different languages.  Also it contains a grouping for the socket. -->
        <ResDir>
            <forLang/>
            <localAt>resdir-misc.rdf</localAt>
            <aResDescForDomain rdf:resource="http://example.com/thermometer/socket"/>
            <groupingForDomain rdf:resource="http://example.com/thermometer/socket"/>
        </ResDir>
    </dirItems>

</ResDir>
```

The <ResDir> element specifies the description of a resource directory.

Typically namespace identifiers are defined within the <ResDir> element.

11.2 The ‘rdf:about’ attribute

The ‘rdf:about’ attribute specifies an unambiguous identifier for a resource directory. This shall be a globally unique identifier in the form of a Uniform Resource Identifier (URI, as specified in IETF RFC 3986).

This URI may or may not be resolvable.

NOTE 1 Target manufacturers and resource providers are encouraged to make resource directories publicly available by posting the resource directory at the URI specified by the ‘rdf:about’ attribute.

The ‘rdf:about’ attribute may be present. If it is not present, the pertaining resource directory is called “anonymous resource directory”.

EXAMPLE <ResDir rdf:about="http://example.com/thermometer/resdir.rdf">

NOTE 2 Use the <localAt> element to specify URIs that are specific to a local network environment.

NOTE 3 The identifier as a value of the attribute rdf:about conforms to the Dublin Core metadata element identifier, http://purl.org/dc/elements/1.1/identifier.

11.3 The <dcterms:conformsTo> element

The <dcterms:conformsTo> specifies a reference to an established standard to which the resource directory conforms. The value, a URI (as specified in IETF RFC 3986), is provided as text content of the element. The value http://myurc.org/iso24752-5/2007 indicates that the described resource directory conforms to this International Standard.

EXAMPLE <dcterms:conformsTo>http://myurc.org/iso24752-5/2007</dcterms:conformsTo>

<dcterms:conformsTo> shall be present and may appear multiple times.

NOTE 1 The value of the <dcterms:conformsTo> element can be used when testing for conformance of a resource directory.

NOTE 2 <dcterms:conformsTo> conforms to the Dublin Core metadata element refinement conformsTo, http://purl.org/dc/terms/conformsTo which is a refinement of the Dublin Core element http://purl.org/dc/elements/1.1/relation.

11.4 The <localAt> element

The <localAt> element specifies a URI (as specified in IETF RFC 3986), given as its content, that can be used to retrieve a local copy of the described resource directory.

The URI may be relative, in which case the URI base is either explicitly provided by the target or implicitly derived from the URI of the containing document. This mechanism is platform specific.

EXAMPLE <localAt>rsheetcollection1.rdf</localAt>

This element shall be present if neither one of <resSheet>, <uiidDesc>, <ResSvcDesc> and <resDir> is present in the parent <ResDir> element; otherwise it shall not be present. In other words: Either the content of the resource directory is provided in the same file (through the <resSheet>, <uiidDesc>, <ResSvcDesc> and <resDir> elements) or externally (through the <localAt> element).

NOTE 1 When used in a target description (TD), relative URIs keep the TD clean of dependencies on a particular networking platform and transport mechanism for retrieving the documents. The only part that has to be platform specific is the fetch mechanism (URI) for the TD. The TD is described in ISO/IEC 24752-4.

NOTE 2 The <localAt> element is meaningful only in a local network environment. This element (with its value) is an exception to the general RDF principle that separate statements on the same resource (with the same identifier) can be merged and are valid on a global scale.

11.5 Scents for resource directories

11.5.1 General

“Scents” may be provided as subelements of <ResDir>, to provide hints as to what the resource directory contains (directly as immediate content or indirectly, possibly over multiple levels of indirection). If a resource directory has a particular scent, that scent applies to all resources that are (directly or indirectly) contained in the resource directory.

Whenever there is a scent that distinguishes a <ResDir> element from its sibling elements in a resource directory tree, this scent should be used for the <ResDir> element.

The scents for resource directories provide hints to different types of direct and indirect content as follows:

- For contained atomic resources, <forLang> (see 11.5.2), <dcterms:audience> (11.5.3), <dc:type> (11.5.4), <dc:format> (11.5.5), <aResDescForDomain> (11.5.6) and <role> (11.5.7) applies, as well as relevant Dublin Core elements (11.5.10).

- For contained grouping resources, <forLang> (see 11.5.2), <dcterms:audience> (11.5.3) and <groupingForDomain> (11.5.8) applies, as well as relevant Dublin Core elements (11.5.10).

- For contained UIIDs, <forLang> (see 11.5.2), <dcterms:audience> (11.5.3) and <uiidForDomain> (11.5.9) applies, as well as relevant Dublin Core elements (11.5.10).

NOTE Atomic resource descriptions, grouping resources and UIIDs don’t automatically inherit the scent elements of a resource directory that contains them. Authors will need to specify the pertaining scent elements for atomic resource descriptions, grouping resources and UIIDs again.

11.5.2 The <forLang> element

The <forLang> element specifies a language that is used for every use context in every atomic resource, grouping resource and UIID that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant languages.

The value space for the content of the <forLang> element is the same as for the <forLang> elements of atomic resources (see 6.7.3.5), grouping resources (see 7.4) and of UIID descriptions (see 9.6).

NOTE An empty <forLang> element indicates that all atomic resources, grouping resources and UIIDs provided by the resource directory are language-independent.

11.5.3 The <dcterms:audience> element

- The <dcterms:audience> element specifies an audience that applies to every atomic resources, grouping resource and UIID that is (directly or indirectly) contained in the resource directory.

- This element may occur any number of times to list all relevant audiences.

The value space for the content of the <dcterms:audience> element is the same as for the <dcterms:audience> element of atomic resources (see 6.13), grouping resources (see 7.8) and of UIID descriptions (see 9.8).

11.5.4 The <dc:type> element

The <dc:type> element specifies a type that applies to every atomic resource that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant types.

The value space for the content of this element is the same as for <dc:type> for atomic resource descriptions (see 6.5).

11.5.5 The <dc:format> element

The <dc:format> element specifies a format that applies to every atomic resource that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant formats.

The value space for the content of this element is the same as for <dc:format> for atomic resource descriptions (see 6.6).

11.5.6 The <aResDescForDomain> element

The <aResDescForDomain> element specifies a domain that is used in every use context of every atomic resource that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant domains.

An ‘rdf:resource’ attribute shall be present. Its value is the URI of the domain of one or more atomic resources that are contained in the resource directory or its children. The domain of an atomic resource is the first part (URI without fragment identifier '#') of the <eltRef> value contained in one of the use contexts of an atomic resource (see 6.7.3.1).

11.5.7 The <role> element

The <role> element specifies a role that is used in every use context of every atomic resource that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant roles.

An 'rdf:resource' attribute shall be present. Its value is a role URI (see 6.7.3.4) of one or more atomic resources that are contained in the resource directory or its children.

11.5.8 The <groupingForDomain> element

The <groupingForDomain> element specifies a domain that applies to every grouping resource that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant domains.

An 'rdf:resource' attribute shall be present. Its value is the name URI of the socket or UIID that a contained grouping resource applies to.

11.5.9 The <uiidForDomain> element

The <uiidForDomain> element specifies a domain that applies to every UIID that is (directly or indirectly) contained in the resource directory.

This element may occur any number of times to list all relevant domains.

An 'rdf:resource' attribute shall be present. Its value is the name URI of the socket that a contained UIID binds to. This is the same URI as specified in <forSocket> of the pertaining <UiidDesc> element (see 9.5).

11.5.10 Dublin Core elements

Additionally any element and element refinement from the Dublin Core Metadata Initiative (DCMI) Metadata Terms (see ISO 15836:2003) may be used if it applies to every item (atomic resource, grouping resource or UIID) that is (directly or indirectly) contained in the resource directory.

Each of these elements and element refinements may occur multiple times within a resource directory.

These elements include, but are not limited to:

- <dc:creator>
- <dc:publisher>
- <dc:contributor>
- <dc:date>
- <dc:rights>

There is no automatic inheritance of properties from a resource directory to a contained resource sheet. If a resource sheet has the same property-value pair as its containing resource directory, the corresponding element shall be specified on both levels.

11.6 The <dirItems> element

The <dirItems> element shall occur once as subelement of <ResDir>.