

UNCLASSIFIED

SOFTWARE COMMUNICATIONS ARCHITECTURE SPECIFICATION

APPENDIX D-1: PLATFORM SPECIFIC MODEL - DOCUMENT TYPE DEFINITION FILES



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APPENDIX D-1 PLATFORM SPECIFIC MODEL (PSM) - DOCUMENT TYPE DEFINITION (DTD) FILES

D-1.1 SCOPE

This appendix defines the SCA Domain Profiles using XML Document Type Definition (DTD) files.

SCA501 DTD files are installed in the domain and shall have ".dtd" as their filename extension. SCA502 All XML files shall have as the first two lines as an XML declaration (?xml) and a document type declaration (!DOCTYPE). The XML declaration specifies the XML version and whether the document is standalone. The document type declaration specifies the DTD for the document. Example declarations are as follows:

```
<?xml version="1.0" standalone="no"?>
<!DOCTYPE softwareassembly SYSTEM
"softwareassembly.4.1.dtd">
```

D-1.2 CONFORMANCE

See SCA Appendix D.

D-1.3 CONVENTIONS

N/A.

D-1.4 NORMATIVE REFERENCES

The following documents contain provisions or requirements which by reference constitute requirements of this appendix.

[1] OMG Document formal/2011-11-01, Common Object Request Broker Architecture (CORBA) Specification, Version 3.1.1 Part 1: CORBA Interfaces, Version 3.2, November 2011.

D-1.5 INFORMATIVE REFERENCES

N/A.

D-1.6 SOFTWARE PACKAGE DESCRIPTOR

The Software Package Descriptor (SPD) is used at deployment time to load a component and its various implementations. The information contained in the SPD will provide the basis for the domain management function to manage the component within the SCA architecture.

The SPD may contain various implementations of any given component. Within the specification of an SPD several other files are referenced including a component level *propertyfile* and a Software Component Descriptor (SCD) file. Within any given implementation there may be additional *propertyfiles*.

SCA503 A Software Package Descriptor file shall have a ".spd.xml" extension.

D-1.6.1 Software Package

The *softpkg* element (Figure 1) indicates an SPD definition. The *softpkg id* uniquely identifies the package. The *softpkg id* attribute definition guarantees uniqueness within an XML document, however an implementation specific approach must be utilized to maintain uniqueness within a Domain Profile. The *name* attribute is a user-friendly label for the *softpkg* element. The *type* attribute indicates whether or not the component implementation is SCA compliant. All files referenced by a software package are located in the same directory as the SPD file or a directory that is relative to the directory where the SPD file is located.

A software package requires at least one implementation. An implementation is a monolithic loadable/executable artifact. A single monolithic loadable/executable artifact is for a General Purpose Processor, Digital Signal Processor or Field Gate Array Processor.

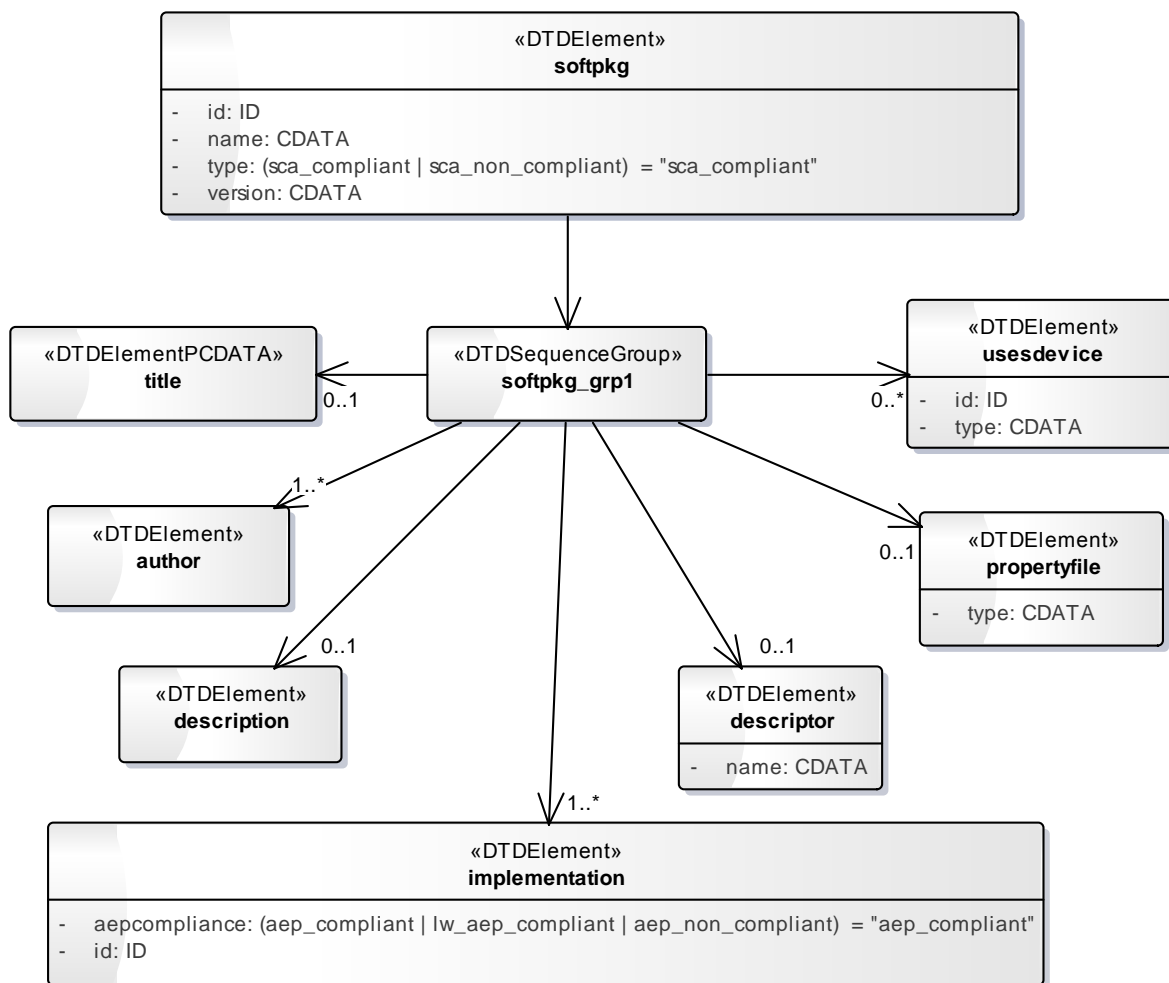


Figure 1: *softpkg* Element Relationships

The set of properties to be used for a software package come from the union of these properties sources using the following precedence order:

1. SPD Implementation Properties
2. SPD level properties
3. SCD properties

Any duplicate properties having the same *id* are ignored. Duplicated properties must be the same property type, only the value can be over-ridden. The implementation properties are only used for the initial configuration and creation of a component by an `ApplicationFactoryComponent` and cannot be referenced by a Software Assembly Descriptor (SAD) *componentinstantiation*, *componentproperties* or *componentfactoryproperties* element.

```
<!--ELEMENT softpkg
  ( title?
    , author+
    , description?
    , propertyfile?
    , descriptor?
    , implementation+
    , usesdevice*
  )>
<!--ATTLIST softpkg
  id ID #REQUIRED
  name CDATA #REQUIRED
  type (sca_compliant | sca_non_compliant) "sca_compliant"
  version CDATA #IMPLIED >
```

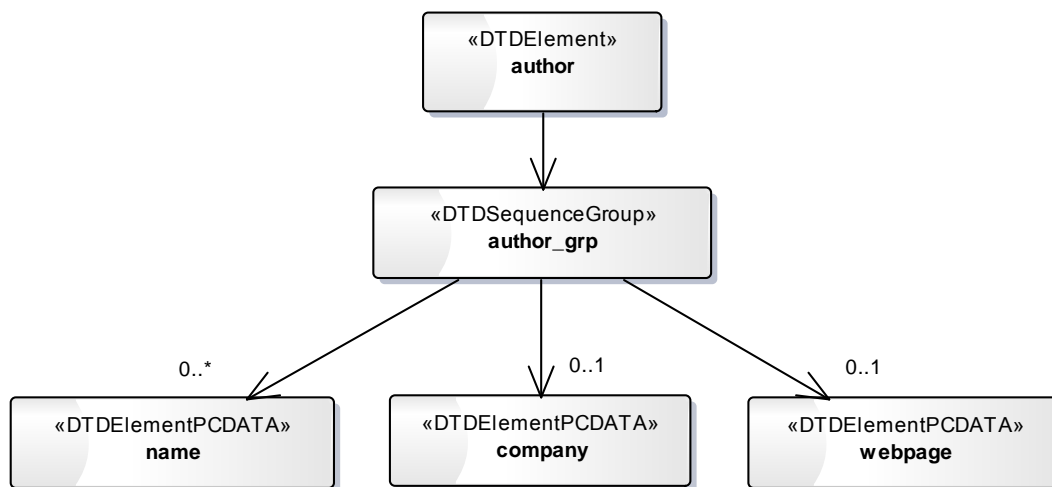
D-1.6.1.1 title

The *title* element is used to indicate the title of the software component being installed in accordance with the *softpkg* element.

```
<!--ELEMENT title (#PCDATA)>
```

D-1.6.1.2 author

The *author* element (see Figure 2) is used to indicate the name of the person, company, and web page of the developer producing the component being installed into the system.

**Figure 2: *author* Element Relationships**

```

<!ELEMENT author
  ( name*
    , company?
    , webpage?
  )>
<!ELEMENT name      (#PCDATA)>
<!ELEMENT company   (#PCDATA)>
<!ELEMENT webpage   (#PCDATA)>
  
```

D-1.6.1.3 *description*

The *description* element is used to describe any pertinent information about the software component being delivered to the system.

```
<!ELEMENT description (#PCDATA)>
```

D-1.6.1.4 *propertyfile*

The *propertyfile* element indicates the local filename of the Property Descriptor (PRF) file associated with the software package. The intent of the *propertyfile* will be to provide the definition of *properties* elements common to all component implementations being deployed in accordance with the software package (*softpkg*). PRF files may also contain *properties* elements that are used in definition of command and control id value pairs used by the SCA *PropertySet* *configure()* and *query()* operations. The format of the *properties* element is described in the PRF (section D-1.8.1).

```

<!--ELEMENT propertyfile
      ( localfile
    )>
<!--ATTLIST propertyfile
      type          CDATA          #IMPLIED>

```

D-1.6.1.4.1 localfile

The *localfile* element is used to reference a file in the same directory as the SPD file or a directory that is relative to the directory where the SPD file is located. When the *name* attribute is a simple name, the file exists in the same directory as the SPD file. A relative directory indication in the *name* attribute begins with either "../" meaning parent directory or "/" meaning current directory. Multiple "../" and directory names can follow the initial "../" in the *name* attribute. All *name* attributes must have a simple name at the end of the file name.

```

<!--ELEMENT localfile EMPTY>
<!--ATTLIST localfile
      name          CDATA          #REQUIRED>

```

D-1.6.1.5 descriptor

The *descriptor* element points to the local filename of the SCD file used to document the interface information for the component being delivered to the system. In the case of an SCA component, the SCD will contain information about three aspects of the component (the component type, message ports, and interface definitions). The SCD file is optional (see section D-1.9 on SCD file).

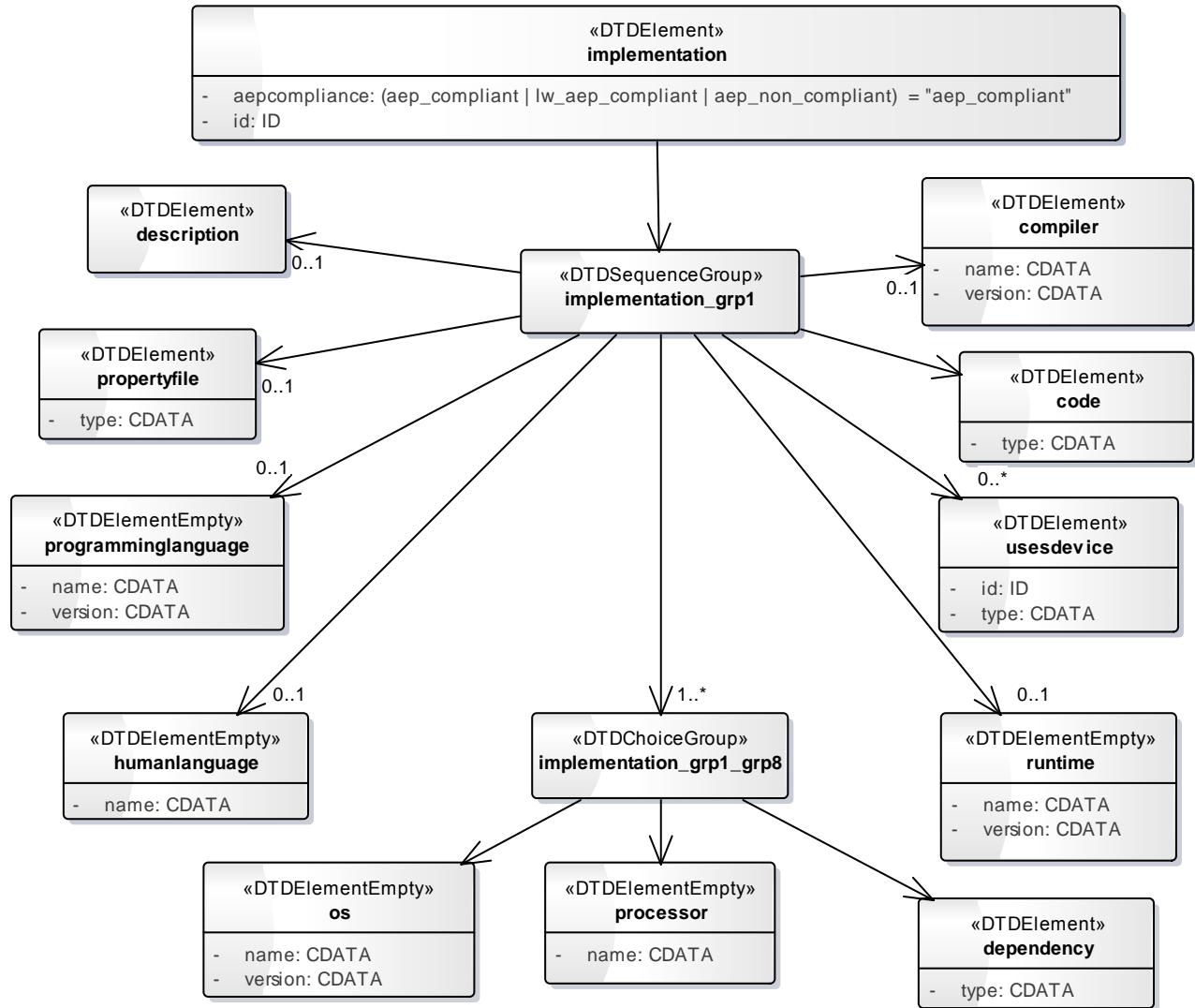
```

<!--ELEMENT descriptor
      (localfile
    )>
<!--ATTLIST descriptor
      name          CDATA          #IMPLIED>

```

D-1.6.1.6 implementation

The *implementation* element (see Figure 3) contains descriptive information about the particular implementation template for a software component contained in the *softpkg* element. The *implementation* element is intended to allow multiple component templates to be delivered to the system in one software package. Each *implementation* element is intended to allow the same component to support different types of processors, operating systems, etc. The *implementation* element will also allow definition of implementation-dependent properties for use in DeviceComponent or ApplicationComponent creation. The *implementation* element's *id* attribute uniquely identifies a specific implementation of the component and an implementation specific approach is required to maintain uniqueness within a Domain Profile. The *compiler*, *programminglanguage*, *humanlanguage*, *os*, *processor*, and *runtime* elements are optional dependency elements.

**Figure 3: *implementation* Element Relationships**


```

<!ELEMENT implementation
  ( description?
    , propertyfile?
    , code
    , compiler?
    , programminglanguage?
    , humanlanguage?
    , runtime?
    , ( os | processor | dependency )+
    , usesdevice*
  )>
<!ATTLIST implementation
  id ID #REQUIRED
  aepcompliance (aep_compliant | lw_aep_compliant |
    aep_non_compliant) "aep_compliant">

```

D-1.6.1.6.1 description

The *description* element is used to describe any pertinent information about the software component implementation that the software developer wishes to document within the software package profile.

```

<!ELEMENT description (#PCDATA)>

```

D-1.6.1.6.2 propertyfile

The *propertyfile* element is used to indicate the local filename of the PRF file associated with this component package described by the *implementation* element. Although the SCA does not restrict the specific use of the PRF file based on context, it is intended within the *implementation* element to provide component implementation specific *properties* elements for use in command and control id value pair settings to the *PropertySet* configure() and query() operations. See section D-1.8.1 on the description of the *properties* element format in the PRF.

```

<!ELEMENT propertyfile
  ( localfile
  )>
<!ATTLIST propertyfile
  type          CDATA          #IMPLIED>

```

D-1.6.1.6.3 code

The *code* element (see Figure 4) is used to indicate the local filename of the code that is described by the *softpkg* element, for a specific implementation of the software component. The optional parameters *stacksize* and *priority* are used by the *ExecutableInterface::execute* operation. Data types for the values of the *stacksize* and *priority* options are unsigned long. The *stacksize* element provides the means to specify a stack size for the process/thread being created. The *priority* element provides the means to specify the scheduling priority for the process/thread

being created. The optional parameter *entrypoint* is used by the *ExecutableInterface::execute* operation. The *entrypoint* element allows the component being delivered to specify the name of its entry point. The data type for the value of the *entrypoint* option is a string. The *type* attribute of the *code* element indicates the type of file being delivered to the system. The valid values for the *type* attribute are: "Executable", "KernelModule", "SharedLibrary", and "Driver."

The meaning of the code *type* attribute:

1. Executable means to use *LoadableInterface::load* and *ExecutableInterface::execute* operations. This is a "main" process.
2. Driver and Kernel Module means load only.
3. SharedLibrary means dynamic linking.
4. Without a code *entrypoint* element means load only.
5. With a code *entrypoint* element means load and *ExecutableInterface::execute*.

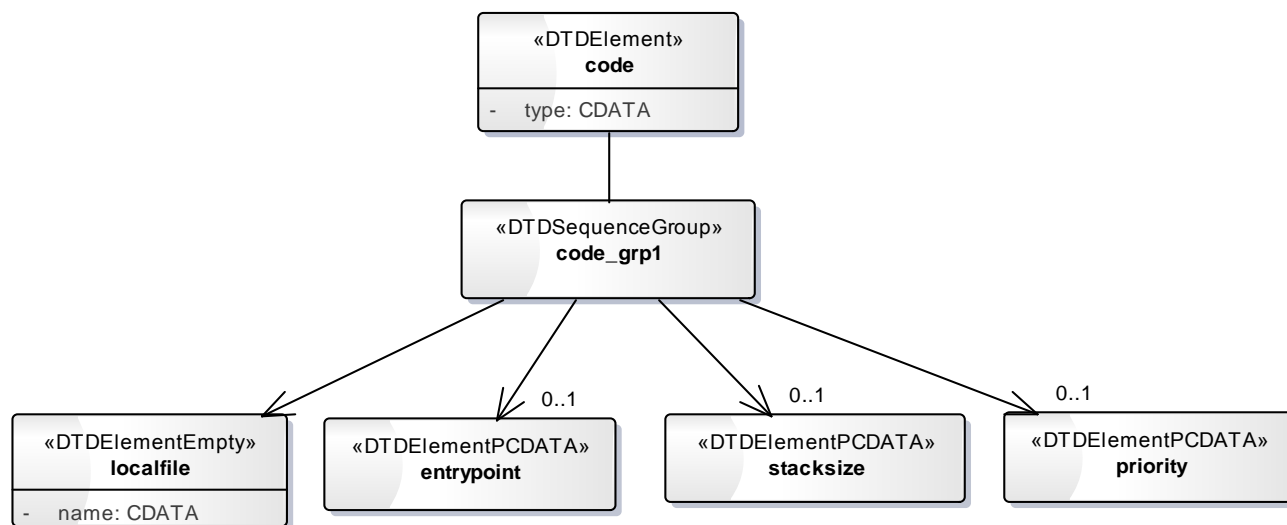


Figure 4: *code* Element Relationships

```

<!ELEMENT code
  ( localfile
    , entrypoint?
    , stacksize?
    , priority?
  )>
<!ATTLIST code
  type CDATA      #IMPLIED>
<!ELEMENT entrypoint (#PCDATA)>
<!ELEMENT stacksize (#PCDATA)>
<!ELEMENT priority (#PCDATA)>

```

D-1.6.1.6.4 compiler

The *compiler* element is used to indicate the compiler used to build the software component being described by the *softpkg* element. The required *name* attribute will specify the name of the compiler used, and the *version* attribute will contain the compiler version.

```

<!ELEMENT compiler EMPTY>
<!ATTLIST compiler
  name      CDATA      #REQUIRED
  version   CDATA      #IMPLIED>

```

D-1.6.1.6.5 programminglanguage

The *programminglanguage* element is used to indicate the type of programming language used to build the component implementation. The required *name* attribute will specify a language such as "c", "c++", or "java".

```

<!ELEMENT programminglanguage EMPTY>
<!ATTLIST programminglanguage
  name      CDATA      #REQUIRED
  version   CDATA      #IMPLIED>

```

D-1.6.1.6.6 humanlanguage

The *humanlanguage* element is used to indicate the human language for which the software component was developed.

```

<!ELEMENT humanlanguage EMPTY>
<!ATTLIST humanlanguage
  name CDATA      #REQUIRED>

```

D-1.6.1.6.7 runtime

The *runtime* element specifies a runtime required by a component implementation. An example of the runtime is a Java VM.

```
<!ELEMENT runtime EMPTY>
<!ATTLIST runtime
    name      CDATA      #REQUIRED
    version   CDATA      #IMPLIED>
```

D-1.6.1.6.8 os

The *os* element is used to indicate the operating system on which the software component is capable of operating. The required *name* attribute will indicate the name of the operating system and the *version* attribute will contain the operating system. The *os* attributes will be defined in a property file as an allocation property of string type and with names *os_name* and *os_version* and an *action* element value other than external. The *os* element is automatically interpreted as a dependency and compared against allocation properties with names of *os_name* and *os_version*. The *os_name* allocation property is defined in Attachment 1 of this appendix.

```
<!ELEMENT os EMPTY>
<!ATTLIST os
    name      CDATA      #REQUIRED
    version   CDATA      #IMPLIED>
```

D-1.6.1.6.9 processor

The *processor* element is used to indicate the processor and/or processor family on which this software component will operate. The processor *name* attribute will be defined in a property file as an allocation property of string type and with a name of *processor_name* and an *action* element value other than external. The *processor* element is automatically interpreted as a dependency and compared against an allocation property with a name of *processor_name*. The *processor_name* allocation property is defined in Attachment 1 of this appendix.

```
<!ELEMENT processor EMPTY>
<!ATTLIST processor
    name CDATA      #REQUIRED>
```

D-1.6.1.6.10dependency

The *dependency* element (see Figure 5) is used to indicate the dependent relationships between the components being delivered and other components and devices, in an SCA compliant system. The *softpkgref* element is used to specify a software package file that must be resident within the system for the component, described by this *softpkg* element, to load without errors. The *propertyref* will reference a specific allocation property, using a unique identifier, and provide the value that will be used by a DeviceComponent capacity model.

A DomainManagerComponent and DeviceManagerComponent will use these dependency definitions to assure that the components and devices which are necessary for proper operation of

the implementation are present and available. The *type* attribute contains descriptive information indicating the type of dependency.

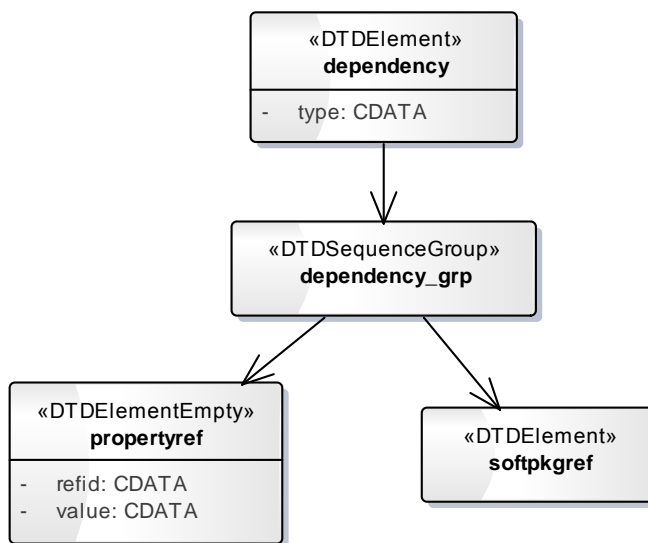


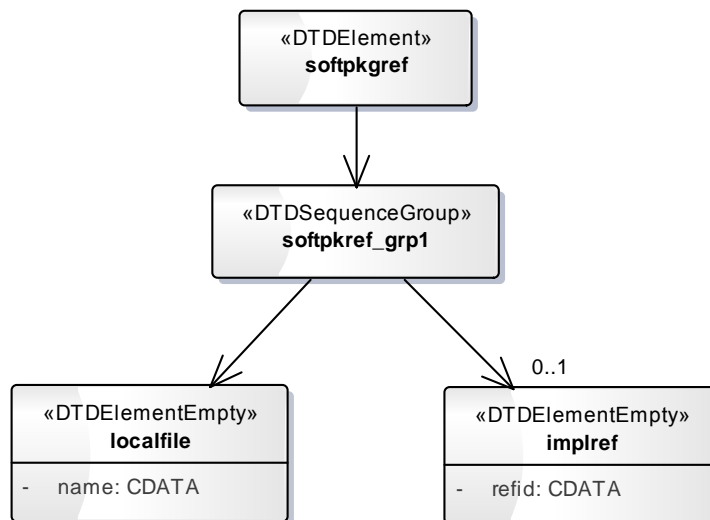
Figure 5: *dependency* Element Relationships

```

<!ELEMENT dependency
    ( softpkgref | propertyref )>
<!ATTLIST dependency
    type CDATA          #REQUIRED>
  
```

D-1.6.1.6.10.1 softpkgref

The *softpkgref* element (see Figure 6) refers to a *softpkg* element contained in another SPD file and indicates a file-load dependency on that file. The other file is referenced by the *localfile* element. An optional *implref* element refers to a particular implementation unique identifier, within the SPD of the other file.

**Figure 6: *softpkgref* Element Relationships**

```

<!ELEMENT softpkgref
  ( localfile
    , implref?
  )>
<!ELEMENT implref EMPTY>
<!ATTLIST implref
  refid      CDATA      #REQUIRED>

```

D-1.6.1.6.10.2 propertyref

The *propertyref* element is used to indicate a unique *refid* attribute that references a *simple* allocation property, defined in the package, and a *property value* attribute used by the domain management function to perform the dependency check.

```

<!ELEMENT propertyref EMPTY>
<!ATTLIST propertyref
  refid      CDATA      #REQUIRED
  value      CDATA      #REQUIRED>

```

D-1.6.1.6.11 usesdevice

The *usesdevice* element describes any "uses" relationships this component has with a device in the system. The *propertyref* element references allocation properties, which indicate the DeviceComponent to be used, and/or the capacity needed from the DeviceComponent to be used.

```

<!ELEMENT usesdevice
  ( propertyref+ )>
<!ATTLIST usesdevice
  id      ID      #REQUIRED
  type    CDATA      #REQUIRED>

```

D-1.6.1.6.11.1 propertyref

See D-1.6.1.6.10.2 for a definition of the *propertyref* element.

D-1.6.1.7 usesdevice

See D-1.6.1.6.11 for a definition of the *usesdevice* element.

D-1.7 DEVICE PACKAGE DESCRIPTOR

The SCA Device Package Descriptor (DPD) is the part of a Device Profile that contains hardware device registration attributes, which are typically used by a Human Computer Interface application to display information about the DeviceComponent(s) resident in an SCA-compliant radio system. DPD information is intended to provide hardware configuration and revision information to a radio operator or to radio maintenance personnel. A DPD may be used to describe a single hardware element residing in a radio or it may be used to describe the complete hardware structure of a radio.

SCA504 A Device Package Descriptor File shall have a ".dpd.xml" extension.

D-1.7.1 Device Package

The *devicepkg* element (see Figure 7) is the root element of the DPD. The *devicepkg id* attribute uniquely identifies the package and an implementation specific approach is required to maintain uniqueness within a Domain Profile. The *version* attribute specifies the version of the *devicepkg*. The format of the version string is numerical major and minor version numbers separated by commas (e.g., "1,0,0,0"). The *name* attribute is a user-friendly label for the *devicepkg*.

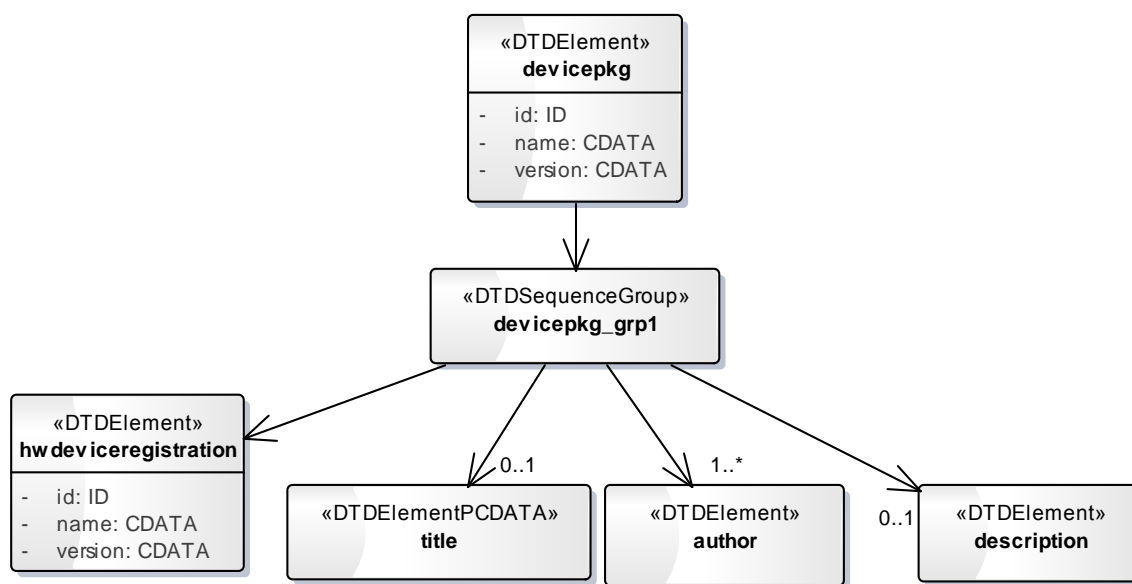


Figure 7: *devicepkg* Element Relationships


```

<!ELEMENT devicepkg
  ( title?
    , author+
    , description?
    , hwdeviceregistration
  )>
<!ATTLIST devicepkg
  id          ID      #REQUIRED
  name        CDATA   #REQUIRED
  version     CDATA   #IMPLIED>

```

D-1.7.1.1 title

The *title* element is used to indicate the title of the hardware device being described by *devicepkg*.

```
<!ELEMENT title (#PCDATA)>
```

D-1.7.1.2 author

See D-1.6.1.2 for a description of the *author* element.

```

<!ELEMENT author
  ( name*
    , company?
    , webpage?
  )>
<!ELEMENT name      (#PCDATA) >
<!ELEMENT company   (#PCDATA) >
<!ELEMENT webpage   (#PCDATA) >

```

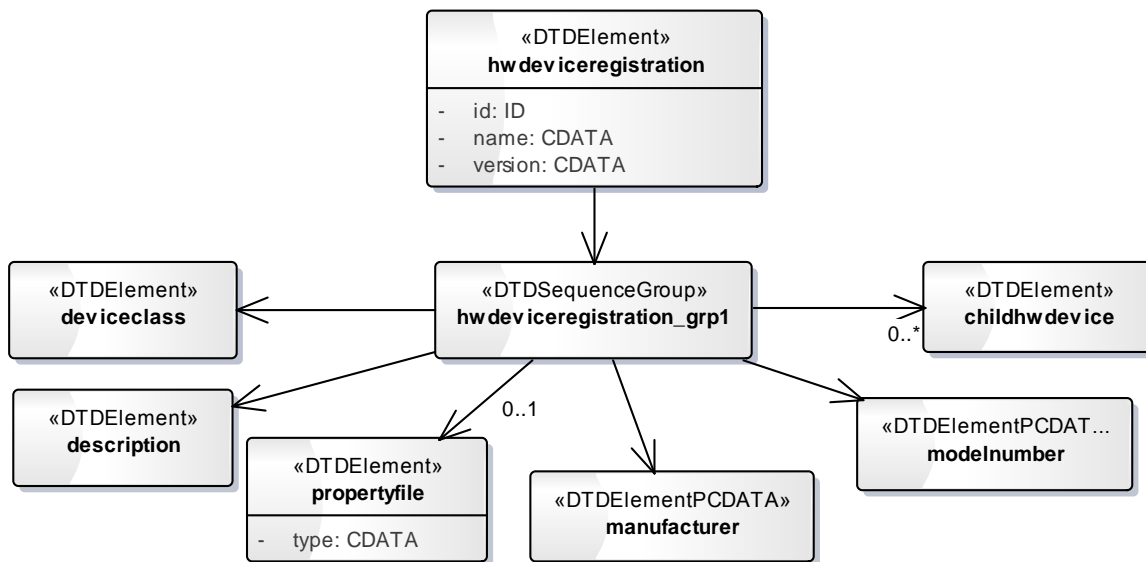
D-1.7.1.3 description

The *description* element is used to describe any pertinent information about the device implementation that the hardware developer wishes to document within the DPD.

```
<!ELEMENT description (#PCDATA)>
```

D-1.7.1.4 hwdeviceregistration

The *hwdeviceregistration* element (see Figure 8) provides device-specific information for a hardware device. The *hwdeviceregistration id* attribute uniquely identifies the device and an implementation specific approach is required to maintain uniqueness within a Domain Profile. The *version* attribute specifies the version of the *hwdeviceregistration* element. The format of the version string is a series of numerical major and minor version numbers separated by commas (e.g., "1,0,0,0"). The *name* attribute is a user-friendly label for the hardware device being registered. At a minimum, the *hwdeviceregistration* element must include a description, the manufacturer, the model number and the device's hardware class(es).

Figure 8: *hwdeviceregistration* Element Relationships

```

<!--ELEMENT hwdeviceregistration
  ( propertyfile?
    , description
    , manufacturer
    , modelnumber
    , deviceclass
    , childhwdevice*
  )>
<!--ATTLIST hwdeviceregistration
  id          ID          #REQUIRED
  name        CDATA       #REQUIRED
  version     CDATA       #IMPLIED>
  
```

D-1.7.1.4.1 propertyfile

The *propertyfile* element is used to indicate the local filename of the property file associated with the *hwdeviceregistration* element. The format of a property file is described in the Properties Descriptor (PRF) (see section D-1.8).

The intent of the property file is to provide the definition of properties elements for the hardware device being deployed and described in the device package (*devicepkg*) or *hwdeviceregistration* element.

```

<!ELEMENT propertyfile
  ( localfile
  )>
<!ATTLIST propertyfile
  type CDATA      #IMPLIED>
<!ELEMENT localfile EMPTY>
<!ATTLIST localfile
  name CDATA      #REQUIRED>

```

D-1.7.1.4.2 description

See D-1.7.1.3 for the definition of the *description* element.

```

<!ELEMENT description (#PCDATA)>

```

D-1.7.1.4.3 manufacturer

The *manufacturer* element is used to convey the name of manufacturer of the device being installed.

```

<!ELEMENT manufacturer (#PCDATA)>

```

D-1.7.1.4.4 modelnumber

The *modelnumber* element is used to indicate the manufacture's model number, for the device being installed.

```

<!ELEMENT modelnumber (#PCDATA)>

```

D-1.7.1.4.5 deviceclass

The *deviceclass* element is used to identify one or more hardware classes that make up the device being installed.

```

<!ELEMENT deviceclass
  ( class+
  )>
<!ELEMENT class (#PCDATA)>

```

D-1.7.1.4.6 childhwdevice

The *childhwdevice* element (see Figure 9) indicates additional device-specific information for hardware devices that make up the root or parent hardware device registration. An example of *childhwdevice* would be a radio's RF module that contains receiver and exciter functions. In this case, a DeviceComponent representing the RF module itself would be a parent device with its DPD, and the receiver and exciter are child devices to the module. The parent / child

relationship implies that when the RF module is removed from the system, the receiver and exciter devices will also be removed.

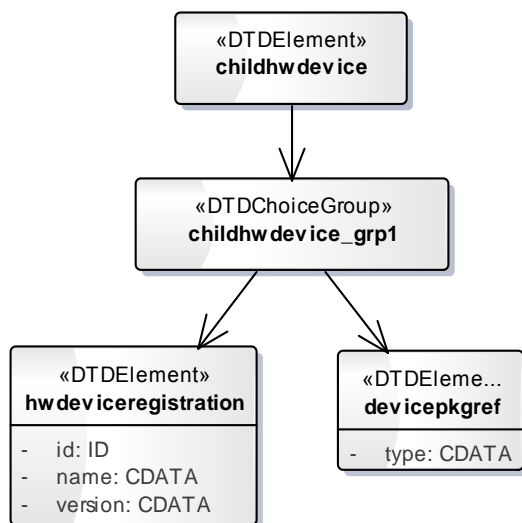


Figure 9: *childhwdevice* Element Relationships

```

<!ELEMENT childhwdevice
  ( hwdeviceregistration | devicepkgref )>
  
```

D-1.7.1.4.6.1 hwdeviceregistration

The *hwdeviceregistration* element provides device-specific information for the child hardware device. See D-1.7.1.4 for definition of the *hwdeviceregistration* element.

D-1.7.1.4.6.2 devicepkgref

The *devicepkgref* element is used to indicate the local filename of a DPD file pointed to by a DPD (e.g., a *devicepkg* within a *devicepkg*).

```

<!ELEMENT devicepkgref
  ( localfile )>
<!ATTLIST devicepkgref
  type CDATA      #IMPLIED>
  
```

D-1.8 PROPERTIES DESCRIPTOR

The Properties Descriptor (PRF) file details component and device attribute settings. For purposes of the SCA, PRF files will contain *simple*, *simplesequence*, *test*, *struct* or *structsequence* elements. These elements will be used to describe attributes of a component that will be used for dependency checking.

These elements will also be used to provide values used by the *PropertySet::configure*, *PropertySet::query*, and *PropertySet::runTest* operations.

SCA494 A Properties Descriptor shall have a ".prf.xml" extension.

D-1.8.1 *properties*

The *properties* element (see Figure 10) is used to describe property attributes that will be used in the *configure* and *query* operations of SCA components that realize the *PropertySet* interface and for definition of attributes used during dependency checking. The *properties* element can also be used by the *TestableInterface::runTest* operation to configure tests and provide test results.

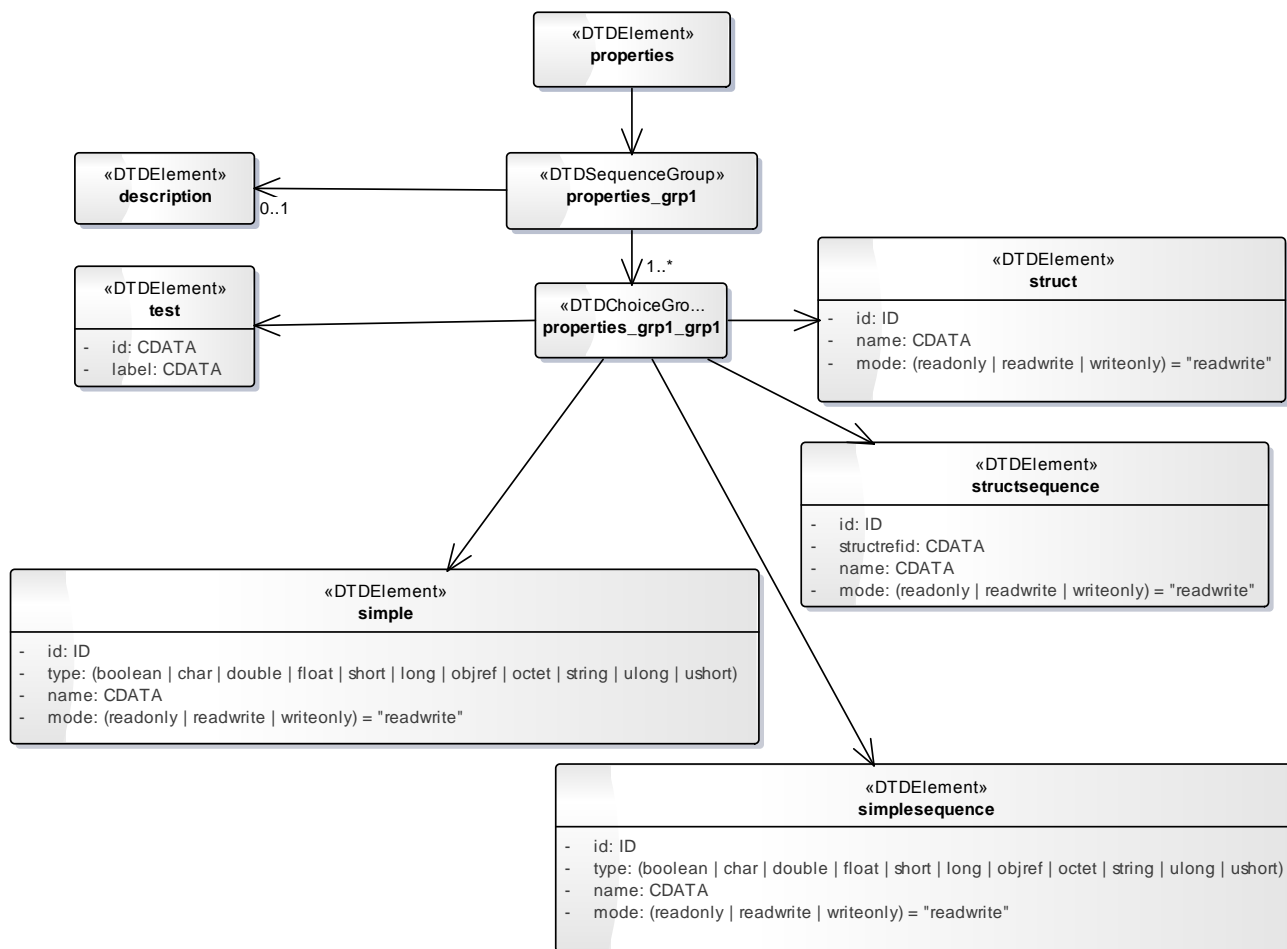
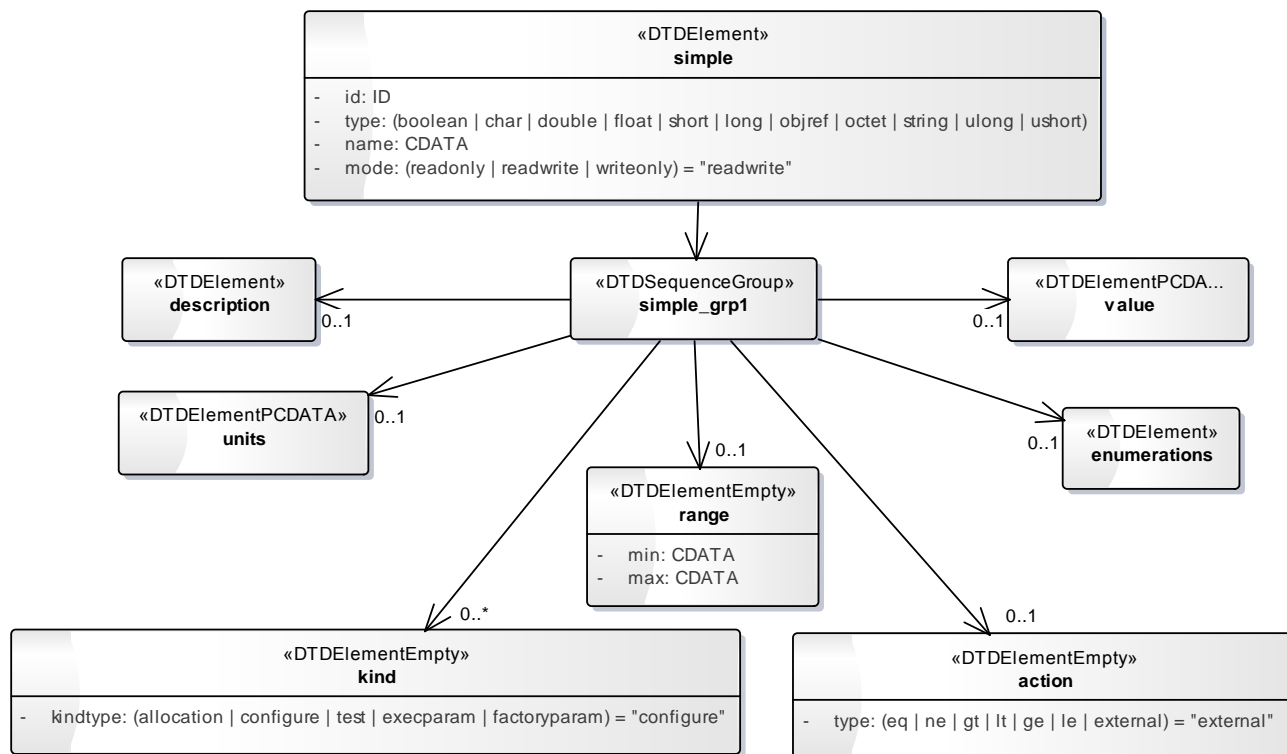


Figure 10: *properties* Element Relationships

```
<!ELEMENT properties
  ( description?
    , (simple | simplesequence | test | struct | structsequence
    )+
  )>
```

D-1.8.1.1 simple

The *simple* element (see Figure 11) supports the definition of properties which include unique *id*, *type*, *name* and *mode* attributes that will be used by the *PropertySet configure()* and *query()* operations for indication of component capabilities, or by the *TestableInterface runTest* operation. The *simple* element is specifically designed to support id-value pair definitions. A *simple* property *id* attribute corresponds to the id of the id-value pair. The *value* and *range* of a *simple* property correspond to the value of the id-value pair. The optional *enumerations* element allows for the definition of a label-to-value for a particular property. The *mode* attribute defines whether the *properties* element is "readonly", "writeonly" or "readwrite". The *id* attribute is an identifier for the *simple* property element. The *id* attribute for a *simple* property that is an allocation type requires an implementation specific approach to maintain uniqueness within a Domain Profile. The *id* attribute for all other *simple* property elements can be any valid XML ID type. The *mode* attribute is only meaningful when the type of the *kind* element is "configure". The *simple* element maps to the types for the CF Primitive types and CORBA module, defined in SCA Appendix C and the OMG CORBA Specification version 3.2 [1] , based upon the type attribute.

Figure 11: *simple* Element Relationships

```

<!ELEMENT simple
  ( description?
  , value?
  , units?
  , range?
  , enumerations?
  , kind*
  , action?
)>
<!ATTLIST simple
  id ID #REQUIRED
  type ( boolean | char | double | float | short | long |
  objref | octet | string | ulong | ushort ) #REQUIRED
  name CDATA #IMPLIED
  mode ( readonly | readwrite | writeonly ) "readwrite">

```

D-1.8.1.1.1 description

The *description* element is used to provide a description of the *properties* element that is being defined.

```

<!ELEMENT description (#PCDATA)>

```

D-1.8.1.1.2 value

The *value* element is used to provide a value for the *properties* element.

```
<!ELEMENT value (#PCDATA)>
```

D-1.8.1.1.3 units

The *units* element describes the intended practical data representation to be used for the *properties* element.

```
<!ELEMENT units (#PCDATA)>
```

D-1.8.1.1.4 range

The *range* element describes the specific *min* and *max* values that are legal for the *simple* element. The intent of the *range* element is to provide a means to perform range validation. This element is not used by ApplicationFactoryComponents or ApplicationManagerComponents.

```
<!ELEMENT range EMPTY>
<!-- ATTENTION: range
      min    CDATA      #REQUIRED
      max    CDATA      #REQUIRED -->
```

D-1.8.1.1.5 enumerations

The *enumerations* element is used to specify one or more *enumeration* elements.

```
<!ELEMENT enumerations
      ( enumeration+ )>
```

The *enumeration* element is used to associate a *value* attribute with a *label* attribute. Enumerations are legal for various integer type *properties* elements. Enumeration values are implied; if not specified by a developer, the initial implied value is 0 and subsequent values are incremented by 1.

Note: The advantage of the *enumeration* element over the *sequence* element is that the *enumeration* element provides a mechanism to associate a value of a property to a label. The *sequence* element does not allow association of values (only lists of sequences).


```
<!ELEMENT enumeration EMPTY>
<!--ATTLIST enumeration
      label      CDATA      #REQUIRED
      value      CDATA      #IMPLIED-->
```

D-1.8.1.1.6 *kind*

The *kind* element's *kindtype* attribute is used to specify the kind of property. The types of *kindtype* attributes are:

1. *configure*, which is used in the *configure* and *query* operations of the *PropertySet* interface. The *ApplicationFactoryComponent* will use the *configure* kind of properties to build the CF *Properties* input parameter to the *configure* operation that is invoked on the *ApplicationControllerComponent* during application creation. The *DeviceManagerComponent* will use the *configure* kind of properties to build the CF *Properties* input parameter to the *configure* operation that is invoked on components implementing the *PropertySet* interface, during device and service creation. The *ApplicationFactoryComponent* and *DeviceManagerComponent* will also use the *configure* kind of properties for *ComponentFactory create* options parameters. When the mode is *readonly*, only the *query* behavior is supported. When the mode is *writable*, only the *configure* behavior is supported. When the mode is *readwrite*, both *configure* and *query* are supported.
2. *test*, which is used in the *runTest* operation of the *TestableInterface* interface. The test kind of properties will be used as the *testValues* parameter to the *runTest* operation that is invoked on components that realize the *TestableInterface* interface.
3. *allocation*, which is used in the *allocateCapacity* and *deallocateCapacity* operations of the *CapacityManagement* interface. The *ApplicationFactoryComponent* uses a component's *simple* dependency properties with a *kindtype* of *allocation* to build the input capacities parameter to the *allocateCapacity* operation when the *action* element of those properties is *external*. The *ApplicationFactoryComponent* uses a component's *simple* dependency properties with a *kindtype* of *allocation* to perform the dependency check when the *action* element is not *external*. A *DeviceManagerComponent* processes allocation properties the same as an *ApplicationFactoryComponent* when deploying a platform components. The only distinction between the two approaches is that a *DeviceComponent* may have either *simple* or *simplesequence* properties for an allocation property with an *action* element that is not *external*. When a *simplesequence* property is used, the dependency check is successful when one value of the sequence passes the dependency check.
4. *execparam*, which is used in the *execute* operations of the *ExecutableInterface* interface. The *ApplicationFactoryComponent* and *DeviceManagerComponent* will use the *execparam* kind of properties to build the CF *Properties* input parameter to the *execute* operation that is invoked on *ExecutableDeviceComponents* during component creation. Only *simple* elements can be used as *execparam* types.

5. *factoryparam*, which is used in the *createComponent* operation of the *ComponentFactory* interface. The *ApplicationFactoryComponent* and *DeviceManagerComponent* will use the *factoryparam* type of properties to build the CF *Properties* input parameter to the *createComponent* operation.

A property can have multiple *kind* elements and the default *kindtype* is *configure*.

```
<!ELEMENT kind EMPTY>
<!ATTLIST kind
    kindtype ( allocation | configure | test | execparam |
    factoryparam) "configure">
```

D-1.8.1.1.7 *action*

The *action* element is used to define the type of comparison used to compare an SPD property value to a device property value, during the process of checking SPD dependencies. The *kindtype* attribute of the *action* element, will determine the type of comparison to be made (e.g., equal, not equal, greater than, etc.). The default value for *kindtype* is *external*.

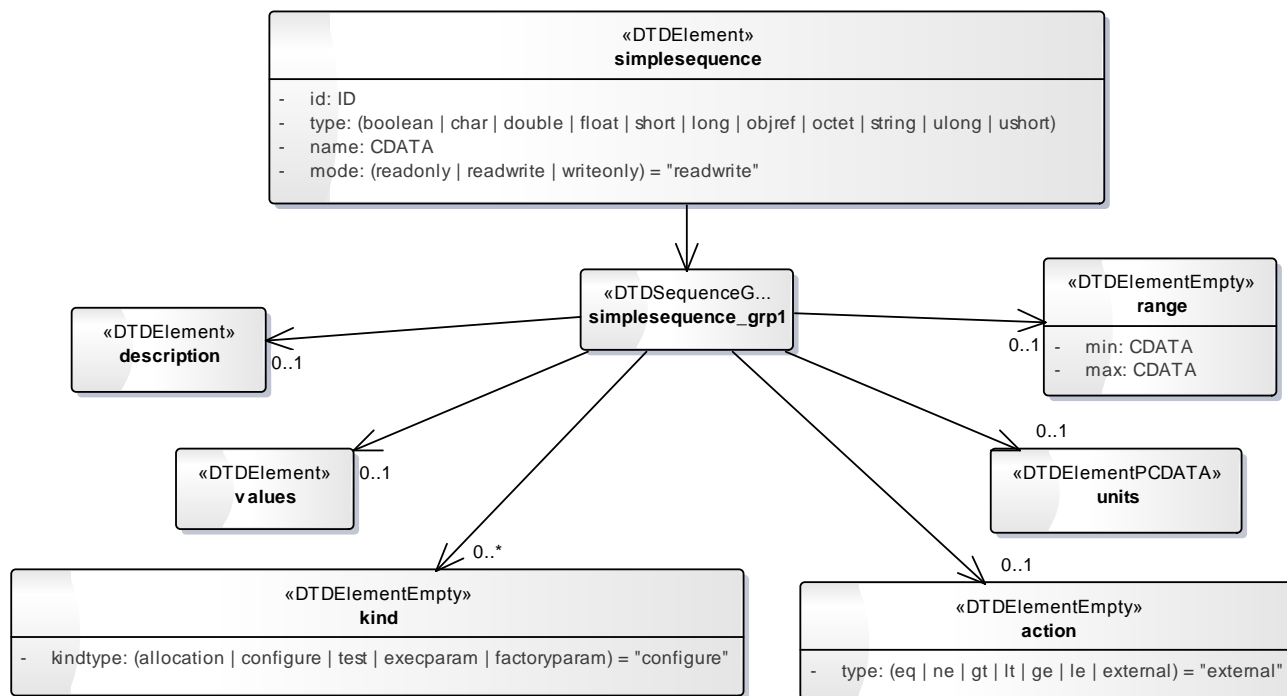
In principle, the *action* element defines the operation executed during the comparison of the allocation property value, provided by an SPD *dependency* element, to the associated allocation property value of a *DeviceComponent*. The allocation property is on the left side of the action and the dependency value is on the right side of the action. This process allows for the allocation of appropriate objects within the system based on their attributes, as defined by their dependent relationships.

For example, if a *DeviceComponent*'s properties file defines a *DeviceKind* allocation property whose *action* element is set to "equal", then at the time of dependency checking a valid *DeviceKind* property is checked for equality. If a software component implementation is dependent on a *DeviceKind* property with its value set to "NarrowBand", then the component's SPD dependency *propertyref* element will reference the *id* of the *DeviceKind* allocation property with a value of "NarrowBand". At the time of dependency checking, the *ApplicationFactoryComponent* and *DeviceManagerComponent* will check *DeviceComponents* whose *properties kind* element is set to "allocation" and property *id* is *DeviceKind* for equality against a "NarrowBand" value.

```
<!ELEMENT action EMPTY>
<!ATTLIST action
    type ( eq | ne | gt | lt | ge | le | external ) "external">
```

D-1.8.1.2 *simplesequence*

The *simplesequence* element (see Figure 12) is used to specify a list of *properties* with the same characteristics (e.g., type, range, units, etc.). The *simplesequence* element definition is similar to the *simple* element definition except that it has a list of values instead of one value. The *simplesequence* element maps to the sequence types for the CF Primitive sequence types defined in SCA Appendix C, based upon the *type* attribute.

Figure 12: *simplesequence* Element Relationships

```

<!ELEMENT simplesequence
  ( description?
    , values?
    , units?
    , range?
    , kind*
    , action?
  )>
<!ATTLIST simplesequence
  id ID #REQUIRED
  type ( boolean | char | double | float | short | long |
  objref | octet | string | ulong | ushort ) #REQUIRED
  name CDATA #IMPLIED
  mode (readonly | readwrite | writeonly) "readwrite">
<!ELEMENT values
  ( value+ )>

```

D-1.8.1.3 test

The *test* element (see Figure 13) is used to specify a list of test properties for executing the *runTest* operation in order to perform a component specific test. This element contains *inputvalue* and *resultvalue* elements and it has an *id* attribute for grouping test properties to a specific test. The *id* attribute will be represented by a numeric value. The optional *label* attribute allows a meaningful label to be associated with a *test* element. *Inputvalues* are used to configure

the test to be performed (e.g., frequency and RF power output level). When the test has completed, *resultvalues* contain the results of the testing (e.g., pass or a fault code/message)

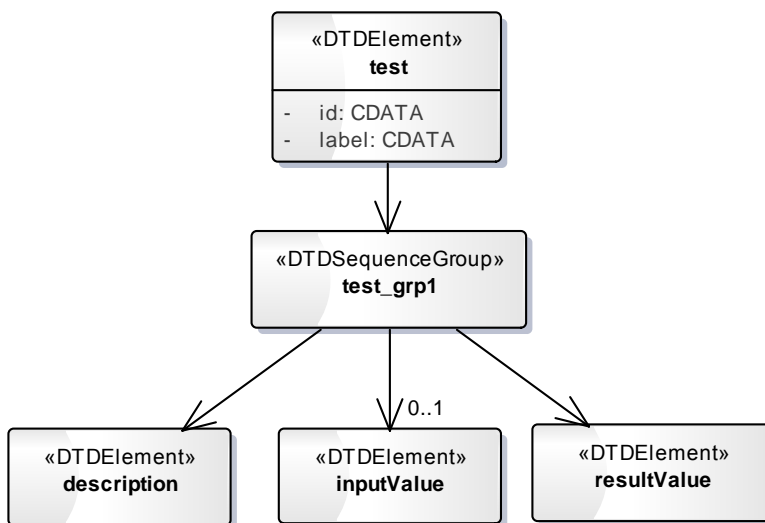


Figure 13: test Element Relationships

```

<!ELEMENT test
  ( description
  , inputvalue?
  , resultvalue
  )>
<!ATTLIST test
  id CDATA #REQUIRED
  label CDATA #IMPLIED>
  
```

D-1.8.1.3.1 inputvalue

The *inputvalue* element is used to provide test configuration properties. The *simple* properties it contains must have a *kindtype* value of test.

```

<!ELEMENT inputvalue
  ( simple+ )>
  
```

D-1.8.1.3.2 resultvalue

The *resultvalue* element is used to specify the desired results of the *runTest* operation. The *simple* properties it contains must have a *kindtype* value of test.

```
<!ELEMENT resultvalue
  ( simple+ )>
```

D-1.8.1.4 *struct*

The *struct* element (see Figure 14) is used to group properties with different characteristics (i.e., similar to a structure or record entry). Each item in the *struct* element can be a different *simple* type (e.g., short, long, etc.). The *struct* element corresponds to the CF *Properties* type where each *struct* item (ID, value) corresponds to a *properties* element list item. The *properties* element list size is based on the number of *struct* items.

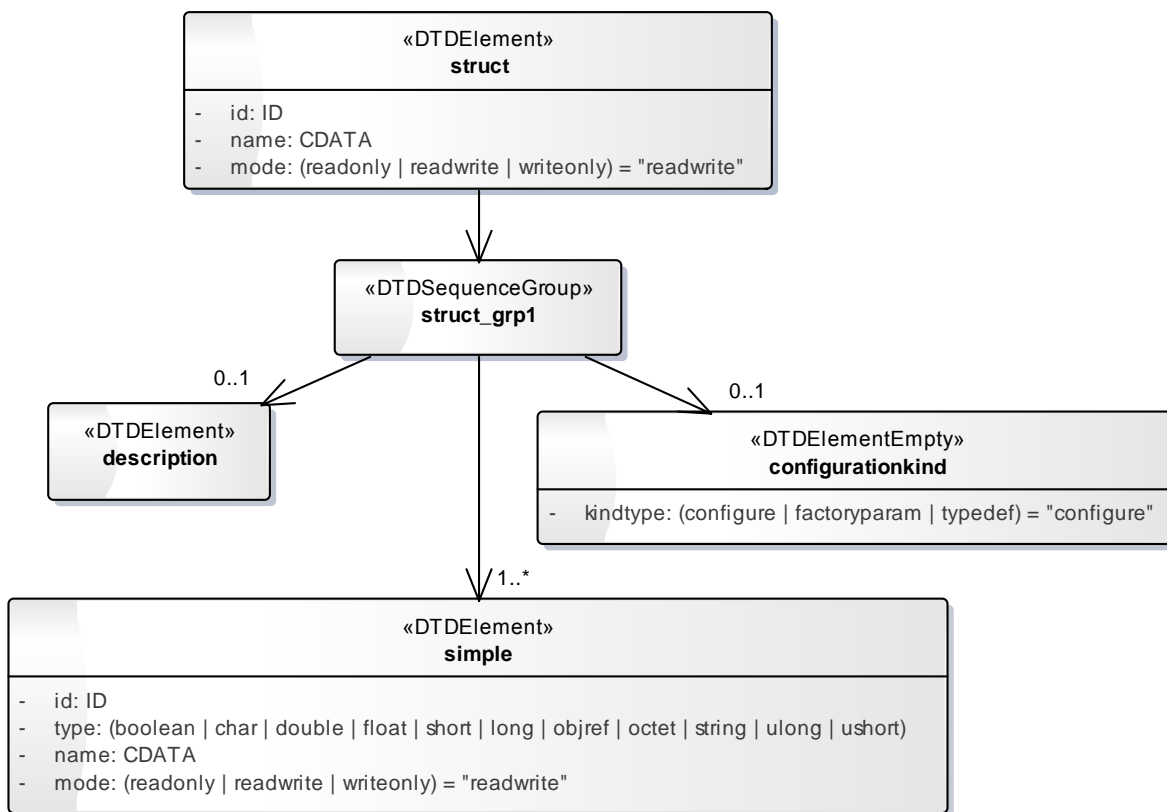


Figure 14: *struct* Element Relationships

```

<!ELEMENT struct
  ( description?
    , simple+
    , configurationkind?
  )>
<!ATTLIST struct
  id      ID          #REQUIRED
  name    CDATA       #IMPLIED
  mode    (readonly | readwrite | writeonly) "readwrite">

```

D-1.8.1.4.1 *configurationkind*

The *configurationkind* element's *kindtype* attribute is used to specify the kind of property. The *kindtypes* are:

1. *configure*, which is used in the *configure* and *query* operations of the *PropertySet* interface. The *ApplicationFactoryComponent* and *DeviceManagerComponent* will use the *configure* kind of properties to build the CF Properties input parameter to the *configure* operation that is invoked on SCA components that realize the *PropertySet* interface during application creation. When the *mode* is *readonly*, only the *query* behavior is supported. When the *mode* is *writeonly*, only the *configure* behavior is supported. When the *mode* is *readwrite*, both *configure* and *query* are supported.
2. *factoryparam*, which is used in the *createComponent* operations of the *ComponentFactory* interface. The *ApplicationFactoryComponent* and *DeviceManagerComponent* will use the *factoryparam* kind of properties to build the CF Properties input parameter to the *createComponent()* operation. A property can have multiple *configurationkind* elements and their default *kindtype* is *configure*.
3. *typedef*, which is used when this definition is to be used a type definition for a *structsequence*. A property of this type will not have an identity independent of the element that references it (i.e. it would not be possible to use the *configure* or *query* operations on this element).

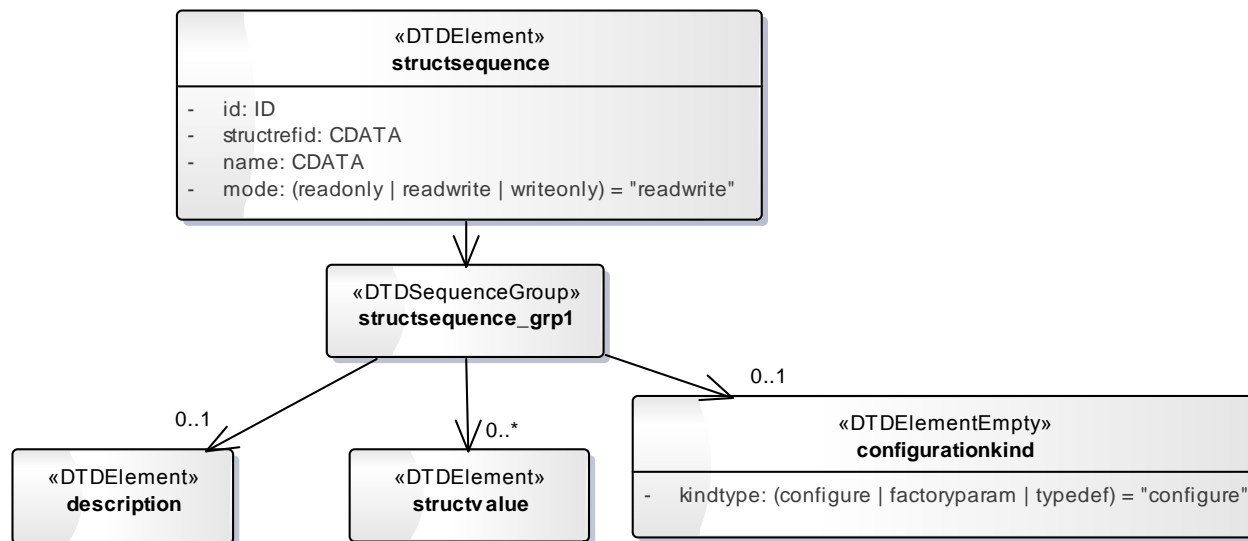
```

<!ELEMENT configurationkind EMPTY>
<!ATTLIST configurationkind
  kindtype (configure | factoryparam | typedef) "configure">

```

D-1.8.1.5 *structsequence*

The *structsequence* element (see Figure 15) is used to specify a list of properties with the same *struct* characteristics. The *structsequence* element maps to a *properties* element having the CF Properties type. Each item in the CF Properties type will be the same *struct* definition as referenced by the *structrefid* attribute. Any values specified within the *struct* definition are ignored and values for the sequence are provided by the *structvalue* element.

**Figure 15: structsequence Element Relationships**

```

<!--ELEMENT structsequence
  ( description?
    , structvalue*
    , configurationkind?
  )>
<!--ATTLIST structsequence
  id          ID          #REQUIRED
  structrefid CDATA       #REQUIRED
  name        CDATA       #IMPLIED
  mode (readonly | readwrite | writeonly) "readwrite">

<!--ELEMENT structvalue
  ( simpleref+ )>

<!--ELEMENT simpleref EMPTY>
<!--ATTLIST simpleref
  refid      CDATA      #REQUIRED
  value      CDATA      #REQUIRED>
  
```

D-1.9 SOFTWARE COMPONENT DESCRIPTOR

The SCA components ManageableApplicationComponent, DeviceComponent, LoadableDeviceComponent, ExecutableDeviceComponent, BaseFactoryComponent, and ServiceComponents that are described by the Software Component Descriptor (SCD) are based on the SCA specification, and this section concentrates on defining the elements necessary for describing the ports and interfaces of these components.

SCA495 A Software Component Descriptor file shall have a ".scd.xml" extension.

D-1.9.1 *softwarecomponent*

The *softwarecomponent* element (see Figure 16) is the root element of the SCD file. For use within the SCA the sub-elements that are supported include:

1. *componentrepid* – is the repository id of the component,
2. *componenttype* – identifies the type of software component object,
3. *componentfeatures* – provides the supported message ports for the component,
4. *interface* – describes the component unique id and name for supported interfaces,
5. *propertyfile* – provides the link to the component's SCD level properties.

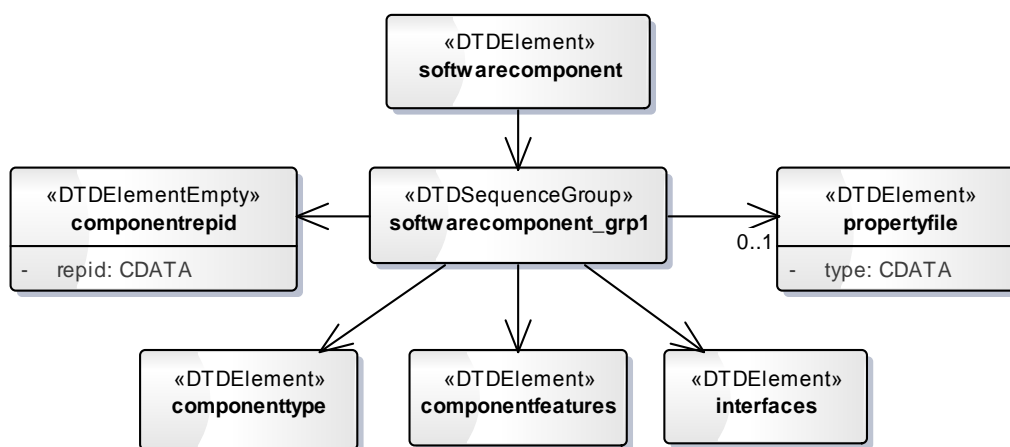


Figure 16: *softwarecomponent* Element Relationships

```
<!ELEMENT softwarecomponent
  ( componentrepid
    , componenttype
    , componentfeatures
    , interfaces
    , propertyfile?
  )>
```


D-1.9.1.1 componentrepid

The *componentrepid* uniquely identifies the principal interface that the component is implementing. The *componentrepid* may be referred to by the *componentfeatures* element. The *componentrepid* is the IDL repository Id of the component's principal interface.

```
<!ELEMENT componentrepid EMPTY>
<!--ATTLIST componentrepid
      repid      CDATA      #REQUIRED-->
```

D-1.9.1.2 componenttype

The *componenttype* describes properties of the component. For SCA components, the component types include APPLICATION_COMPONENT, DEVICE_COMPONENT, LOADABLE_DEVICE_COMPONENT, EXECUTABLE_DEVICE_COMPONENT, MANAGEABLE_SERVICE_COMPONENT, SERVICE_COMPONENT, DEVICE_MANAGER_COMPONENT, DOMAIN_MANAGER_COMPONENT, APPLICATION_MANAGER_COMPONENT, APPLICATION_FACTORY_COMPONENT, APPLICATION_COMPONENT_FACTORY_COMPONENT and PLATFORM_COMPONENT_FACTORY_COMPONENT.

```
<!--ELEMENT componenttype (#PCDATA)-->
```

D-1.9.1.3 componentfeatures

The *componentfeatures* element (see Figure 17) is used to describe a component with respect to the interfaces that it inherits, either directly or indirectly, from its principal interface which are represented by its provides and uses *ports*. If a component extends any SCA interfaces, then all of the inherited interfaces are depicted as *supportsinterface* elements.

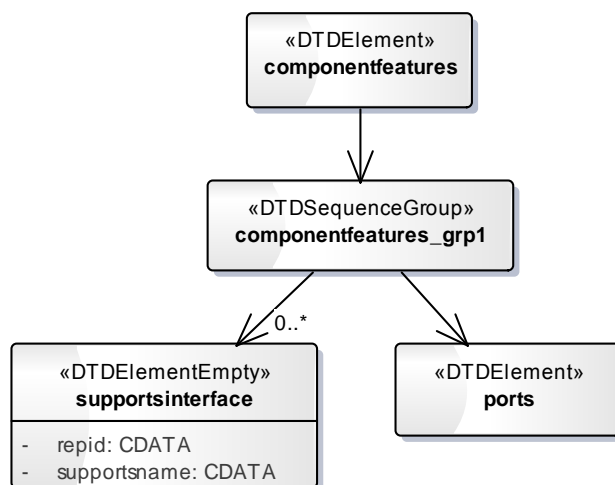


Figure 17: *componentfeatures* Element Relationships

```
<!ELEMENT componentfeatures
  ( supportsinterface*
    , ports
  )>
```

D-1.9.1.3.1 supportsinterface

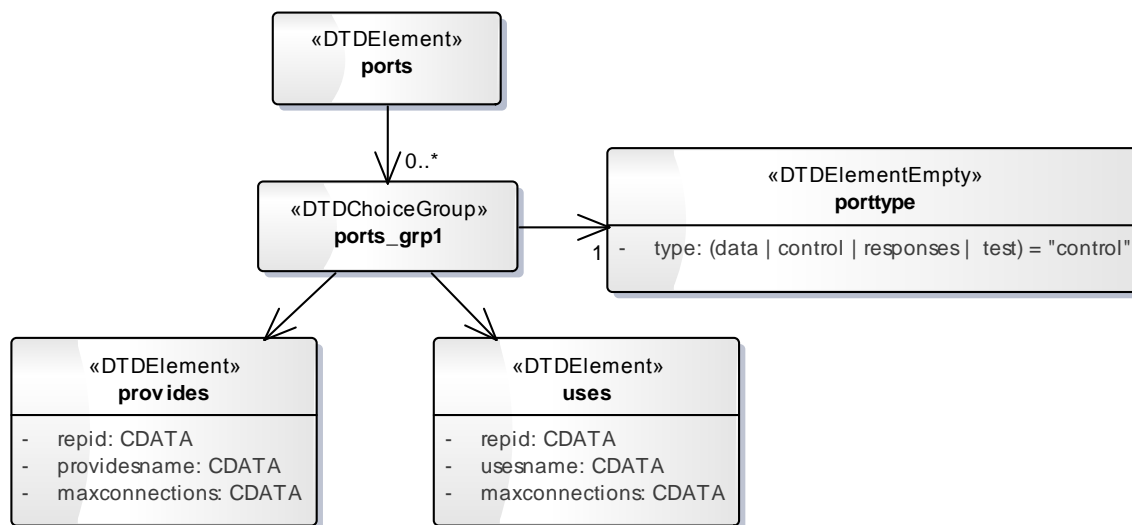
The *supportsinterface* element is used to identify an interface definition that the component supports. These are all of the interfaces inherited either directly or indirectly by the component's principal interface, which is defined by the *componentrepid* element. One can widen the component's interface to be a *supportsinterface*. The *repid* is used to refer to the *interface* element (see *interfaces* section D-1.9.1.4).

```
<!ELEMENT supportsinterface EMPTY>
<!ATTLIST supportsinterface
  repid          CDATA          #REQUIRED
  supportsname   CDATA          #REQUIRED>
```

D-1.9.1.3.2 ports

The *ports* element (see Figure 18) describes what interfaces a component provides and uses.

The *provides* elements represent interfaces that are not part of a component's interface but are independent interfaces known as facets (i.e. a provides port at the end of a path, like I/O Device or Modem Device). The *uses* element is -uses port at the start of a path (i.e. I/O Device) that is connected to a *provides* or *supportinterfaces* interface. Any number of *uses* and *provides* elements can be given in any order. Each *ports* element has a name and references an interface by *repid* (see *interfaces* section D-1.9.1.4). The port names are used in the SAD to connect ports together. The *maxconnections* attribute allows the developer to specify how many simultaneous connections are allowed to be made using that port. A *ports* element also has an optional *porttype* element that allows for identification of port classification. Values for *porttype* include "data", "control", "responses", and "test". If a *porttype* is not given then "control" is assumed.

Figure 18: *ports* Element Relationships

```

<!ELEMENT ports
  ( provides | uses ) *
>
<!ELEMENT provides
  ( porttype* ) >
<!ATTLIST provides
  repid          CDATA          #REQUIRED
  providesname   CDATA          #REQUIRED
  maxconnections CDATA          #REQUIRED>
<!ELEMENT uses
  ( porttype*
)>
<!ATTLIST uses
  repid          CDATA          #REQUIRED
  usesname       CDATA          #REQUIRED
  maxconnections CDATA          #REQUIRED>
<!ELEMENT porttype EMPTY>
<!ATTLIST porttype
  type ( data | control | responses | test ) #REQUIRED>
  
```

D-1.9.1.4 interfaces

The *interfaces* element is made up of one to many *interface* elements.

```

<!ELEMENT interfaces
  ( interface+ ) >
  
```

The *interface* element describes an interface that the component, either inherits directly or indirectly, provides or uses. The *name* attribute is the character-based, non-qualified name of the interface. The *repid* attribute is the unique IDL repository id [1] of the interface. The *repid* is

also used to reference an *interface* element elsewhere in the SCD, for example from the *inheritsinterface* element.

```
<!--ELEMENT interface
      ( inheritsinterface*) >
<!--ATTLIST interface
      repid      CDATA      #REQUIRED
      name       CDATA      #REQUIRED>
<!--ELEMENT inheritsinterface EMPTY>
<!--ATTLIST inheritsinterface
      repid      CDATA      #REQUIRED>
```

D-1.9.1.5 propertyfile

The *propertyfile* element is used to indicate the local filename of the PRF file associated with the software component. The description of the *propertyfile* element can be found in section D-1.6.1.4. Within the SCD, the *localfile* sub-element of the *propertyfile* element is a relative pathname referencing a file in the same directory as the SCD or in a directory that is relative to the directory where the SCD file is located.

```
<!--ELEMENT propertyfile
      ( localfile
) >
<!--ATTLIST propertyfile
      type      CDATA      #IMPLIED>
<!--ELEMENT localfile EMPTY>
<!--ATTLIST localfile
      name      CDATA      #REQUIRED>
```

D-1.10 SOFTWARE ASSEMBLY DESCRIPTOR

This section describes the XML elements of the Software Assembly Descriptor (SAD) XML file; the *softwareassembly* element (see Figure 19). The intent of the software assembly is to provide the means of describing the assembled functional application and the interconnection characteristics of the SCA components within that application. Created applications are assembled from a combination of one or more component instantiations and nested assembly instantiations that are interconnected with each other and to platform devices and services.

SCA496 A Software Assembly Descriptor file shall have a ".sad.xml" extension.

D-1.10.1 softwareassembly

The installation of an application into the system includes the installation of a main SAD file and one or more SPD and SAD files. The SAD file references component SPD files to obtain deployment information for these components, as well SAD files for nested applications. The *softwareassembly* element's *name* attribute uniquely identifies the assembly, requiring an implementation specific approach to maintain uniqueness within a Domain Profile. The *softwareassembly* element's *version* attribute is the version of the application. The *softwareassembly* element's *sca_version* attribute is the targeted SCA version (i.e., V4.1) of the application.

The SAD *deploymentdependencies* are merged with and overridden by lower-level *deploymentdependencies* defined within the *componentinstantiation* and *assemblyinstantiation* elements.

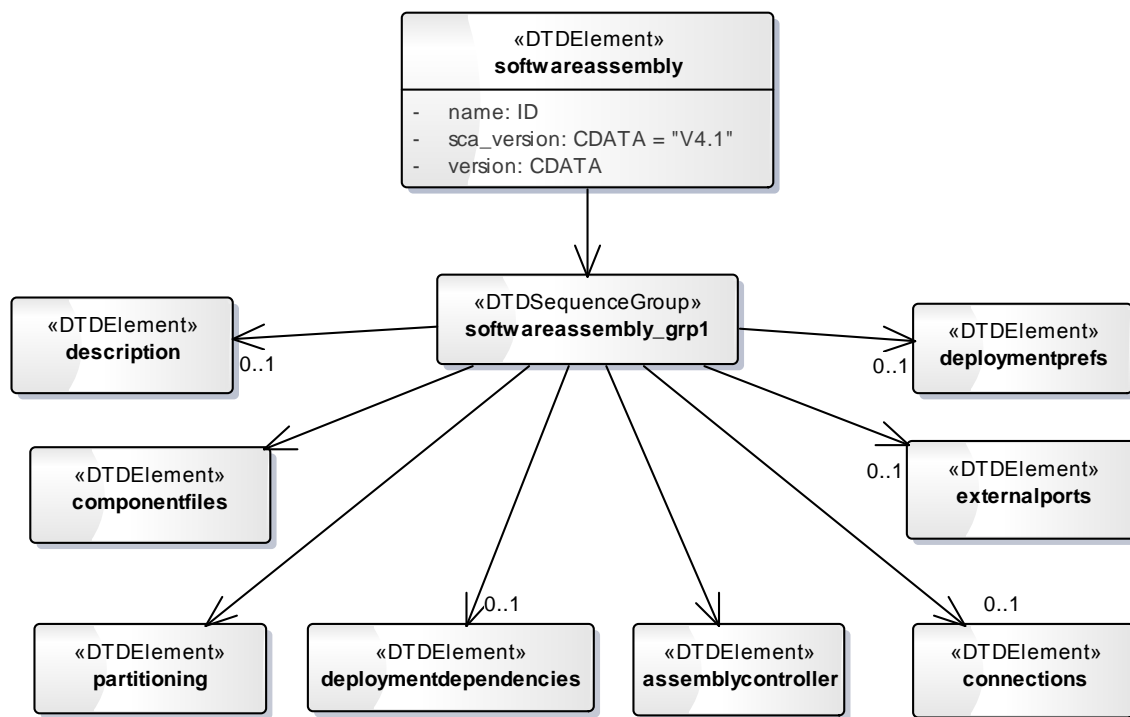


Figure 19: *softwareassembly* Element Relationships

```

<!ELEMENT softwareassembly
  ( description?
    , componentfiles
    , partitioning
    , deploymentdependencies?
    , assemblycontroller
    , connections?
    , externalports?
    , deploymentprefs?
  )>
<!ATTLIST softwareassembly
  name      ID      #REQUIRED
  sca_version CDATA  "V4.1"
  version   CDATA  #IMPLIED>
  
```

D-1.10.1.1 description

The *description* element of the component assembly may be used to describe any information the developer would like to provide about the assembly.

```

<!ELEMENT description (#PCDATA)>
  
```

D-1.10.1.2 componentfiles

The *componentfiles* element is used to indicate that an assembly is made up of 1..n component files and / or subassemblies. The *componentfile* element contains a reference to a local file, which can be an SPD or SAD file.

```
<!ELEMENT componentfiles
    ( componentfile+ )>
```

D-1.10.1.2.1 componentfile

The *componentfile* element is a reference to a local file. See section D-1.6.1.4.1 for the definition of the *localfile* element. The *type* attribute is "Software Package Descriptor" or "Software Assembly Descriptor".

```
<!ELEMENT componentfile
    ( localfile )>
<!ATTLIST componentfile
    id          ID      #REQUIRED
    type        CDATA   #IMPLIED>
```

D-1.10.1.3 partitioning

A component *partitioning* element (see Figure 20) specifies a deployment pattern of components and their components-to-hosts relationships as well as nested sub-applications. A component instantiation is captured inside a *componentplacement* element. The *hostcollocation* element allows the components to be placed on a common device. When the *componentplacement* is by itself and not inside a *hostcollocation*, it has no collocation constraints. An assembly instantiation (nested sub-application) is captured within an *assemblyplacement* element.

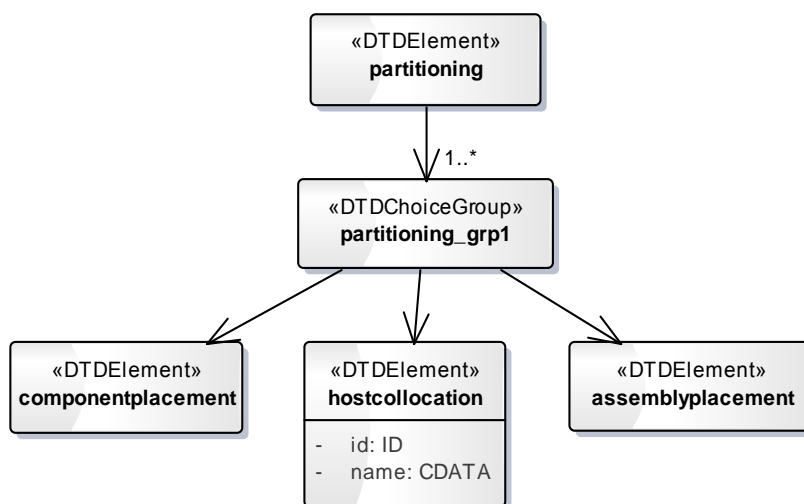


Figure 20: *partitioning* Element Relationships

```
<!ELEMENT partitioning
  ( componentplacement | hostcollocation |
    assemblyplacement )+>
```

D-1.10.1.3.1 *componentplacement*

The *componentplacement* element (see Figure 21) defines a particular deployment of a component. The component can be deployed either directly or by using a *ComponentFactory*.

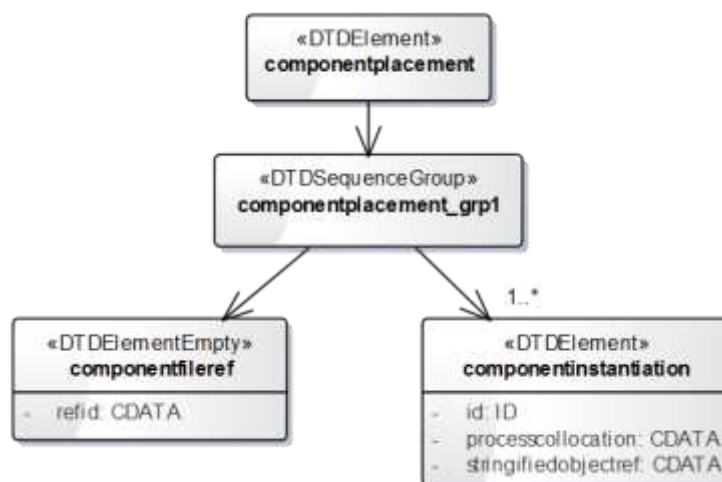


Figure 21: *componentplacement* Element Relationships

```
<!ELEMENT componentplacement
  ( componentfileref
    , componentinstantiation+
  )>
```

D-1.10.1.3.1.1 *componentfileref*

The *componentfileref* element is used to reference a particular SPD or a SAD file. The *componentfileref* element's *refid* attribute corresponds to the *componentfile* element's *id* attribute.

```
<!ELEMENT componentfileref EMPTY>
<!ATTLIST componentfileref
  refid      CDATA      #REQUIRED>
```

D-1.10.1.3.1.2 *componentinstantiation*

The *componentinstantiation* element (see Figure 22) is intended to describe a particular instantiation of a component relative to a *componentplacement* element. The *componentinstantiation*'s *id* attribute is an implementation specific value that uniquely identifies the component within a Domain Profile. The *componentinstantiation* element's *id* may be referenced by the *usesport* and *providesport* elements within the SAD file. It is the component name for the instantiation and not the application name. The *componentinstantiation* element's *stringifiedobjectref* attribute, when specified, is the component instantiation object reference that requires dynamic connections. The *componentinstantiation* element's optional

processcollocation attribute indicates a specific logical process in which the component instance must be executed. The *processcollocation* attribute is used within the options parameter of the *ExecutableInterface::execute* operation.

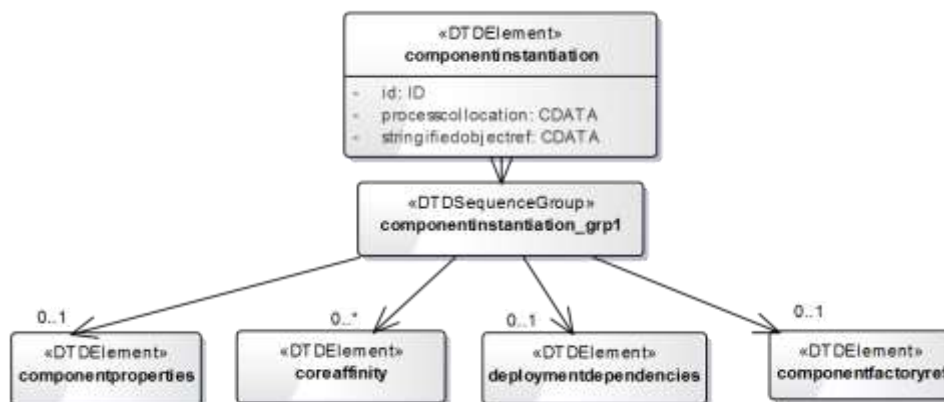


Figure 22: *componentinstantiation* Element Relationships

```

<!ELEMENT componentinstantiation
  ( componentproperties?
    , coreaffinity*
    , deploymentdependencies?
    , componentfactoryref?
  )>
<!ATTLIST componentinstantiation
  id      ID      #REQUIRED
  processcollocation  CDATA #IMPLIED
  stringifiedobjectref CDATA #IMPLIED>
  
```

D-1.10.1.3.1.2.1 *componentproperties*

The optional *componentproperties* element (see D-1.10.1.3.3.1.1) is a list of configure, factoryparam, and/or execparam properties values that are used in creating the component or for the initial configuration of the component.

The following sources will be searched in the given precedence order for initial values of properties with a *kindtype* of "execparam" or "configure" and a *mode* attribute of "readwrite" or "writeonly":

1. The SAD partitioning : componentplacement : componentinstantiation element,
2. The value or default value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

The following sources will be searched in the given precedence order for initial values of properties with a *kindtype* of "factoryparam":

1. The SAD *partitioning : componentplacement : componentinstantiation : componentfactoryref : componentfactoryproperties* element,
2. The SAD *partitioning : componentplacement : componentinstantiation : componentproperties* element,
3. The value or default value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

D-1.10.1.3.1.2.2 *coreaffinity*

The optional *coreaffinity* element indicates a preferred processor core for execution of a component instance. The *coreaffinity* element is used within the options parameter of the *ExecutableInterface::execute* operation.

The data type of the *coreaffinity* element is an unsigned long and its value is platform dependent.

[<!ELEMENT coreaffinity \(#PCDATA\)>](#)

D-1.10.1.3.1.2.3 *deploymentdependencies*

The optional *deploymentdependencies* element (described generically in section D-1.10.1.3.3.1.4) overrides a *componentinstantiation*'s SPD and SAD dependencies.

D-1.10.1.3.1.2.4 *componentfactoryref*

The optional *componentfactoryref* element (see Figure 23) refers to a particular ApplicationComponentFactoryComponent *componentinstantiation* element found in the SAD, which is used to obtain an ApplicationComponent reference for this *componentinstantiation* element. The *refid* attribute refers to a unique *componentinstantiation id* attribute.

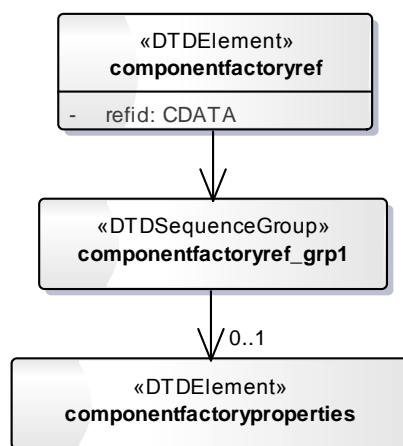


Figure 23: *componentfactoryref* Element Relationships

```

<!ELEMENT componentfactoryref
      ( componentfactoryproperties? )>
<!ATTLIST componentfactoryref
      refid      CDATA      #REQUIRED>

```

D-1.10.1.3.1.2.4.1 componentfactoryproperties

The optional *componentfactoryproperties* element (see Figure 24) specifies the properties "qualifiers", for the *ComponentFactory::createComponent* call.

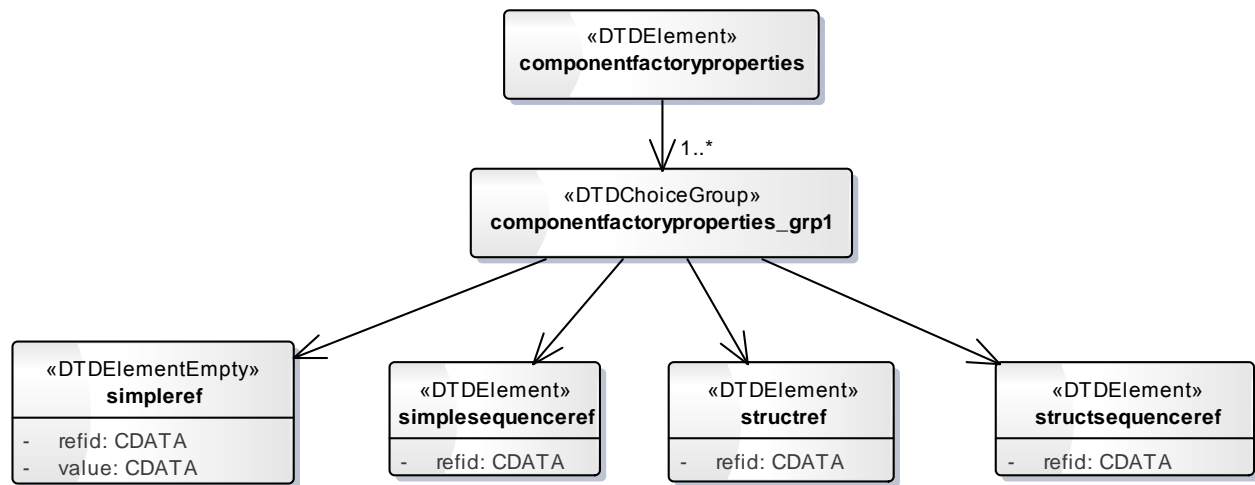


Figure 24: *componentfactoryproperties* Element Relationships

```

<!ELEMENT componentfactoryproperties
  ( simpleref | simplesequenceref | structref |
    structsequenceref )+ >
<!ELEMENT simpleref EMPTY>
<!ATTLIST simpleref
  refid      CDATA      #REQUIRED
  value      CDATA      #REQUIRED>
<!ELEMENT simplesequenceref
  ( values )>
<!ATTLIST simplesequenceref
  refid      CDATA      #REQUIRED>
<!ELEMENT structref
  ( simpleref+ )>
<!ATTLIST structref
  refid      CDATA      #REQUIRED>
<!ELEMENT structsequenceref
  ( structvalue+ )>
<!ATTLIST structsequenceref
  refid      CDATA      #REQUIRED>
<!ELEMENT structvalue
  ( simpleref+ )>
<!ELEMENT values
  ( value+ )>
<!ELEMENT value (#PCDATA)>

```

D-1.10.1.3.2 hostcollocation

The *hostcollocation* element specifies a group of component instances that are to be deployed together on a single host. For purposes of the SCA, the *componentplacement* element will be used to describe the 1...n components that will be collocated on the same host platform. Within the SCA specification, a host platform will be interpreted as a single device. The *id* and *name* attributes are optional but may be used to uniquely identify a set of collocated components within a SAD file.

```

<!ELEMENT hostcollocation
  ( componentplacement )+>
<!ATTLIST hostcollocation
  id      ID      #IMPLIED
  name    CDATA    #IMPLIED>

```

D-1.10.1.3.2.1 componentplacement

See *componentplacement*, section D-1.10.1.3.1.

D-1.10.1.3 assemblyplacement

The *assemblyplacement* element (see Figure 25) defines a particular deployment of a nested subassembly. It references the SAD file for that nested subassembly and an *assemblyinstantiation* element defining its creation.

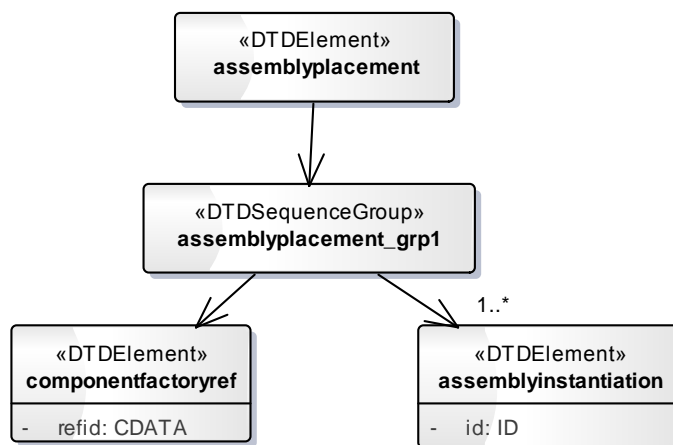


Figure 25: *assemblyplacement* Element Relationships

```

<!ELEMENT assemblyplacement
  ( componentfileref
    , assemblyinstantiation+
  )>
  
```

D-1.10.1.3.3.1 assemblyinstantiation

The *assemblyinstantiation* element (see Figure 26) describes an instantiation of an assembly as a nested sub-application relative to an *assemblyplacement* element. This *assemblyinstantiation* (which itself can potentially contain other nested sub-applications) can then be connected and controlled through the *assemblycontroller* and *externalports* elements defined in the referenced SAD file. *Assemblyinstantiation* creation can be viewed as essentially similar to a normal application created by an *ApplicationFactoryComponent*, with the omission of the registration of the sub-application's *ApplicationManagerComponent* with the *DomainManagerComponent*.

The *assemblyinstantiation's id* attribute is an implementation specific value that uniquely identifies the assembly within a Domain Profile. The *assemblyinstantiation* element's *id* may be referenced by the *usesport* and *providesport* elements within the enclosing SAD file when connecting to / from ports listed in the sub-application's SAD *externalports* element.

The *assemblyinstantiation* element contains a number of sub-elements used by the core framework in the creation, deployment and configuration of the sub-application. Most of these elements appear only as sub-elements of the *assemblyinstantiation* element.

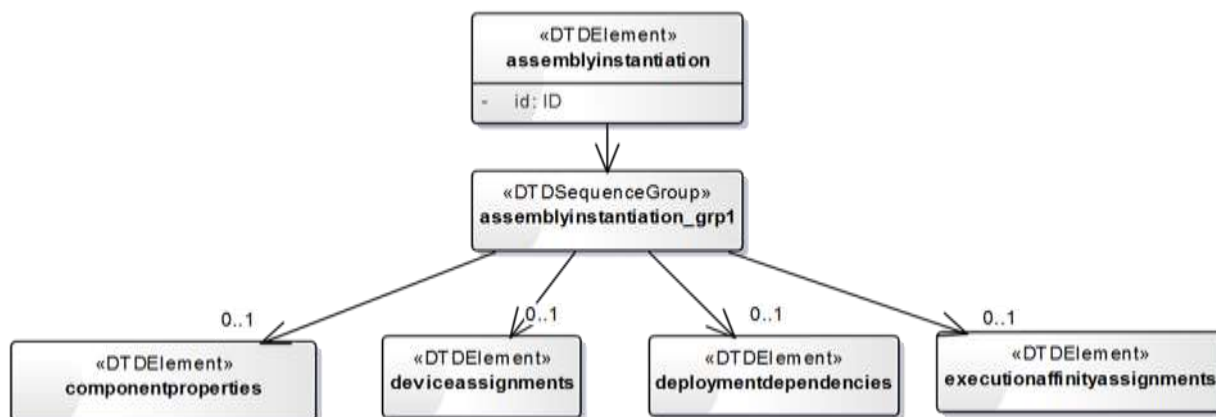


Figure 26: *assemblyinstantiation* Element Relationships

```

<!ELEMENT assemblyinstantiation
( componentproperties?
, deviceassignments?
, deploymentdependencies?
, executionaffinityassignments?
)>
<!ATTLIST assemblyinstantiation
id ID #REQUIRED>
  
```

D-1.10.1.3.3.1.1 componentproperties

The optional *componentproperties* element (see Figure 27) is a list of *configure*, *factoryparam*, and/or *execparam* property values that are used in creating and / or initially configuring the components of the sub-application. For valid properties with a *kindtype* of "execparam" or "factoryparam", or "configure" properties with a *mode* attribute of "readwrite" or "writeonly", values will supplement or (if of the same name), override sub-application values following the given precedence order:

1. The outer SAD partitioning : *assemblyplacement* : *assemblyinstantiation* element,
2. The nested SAD *componentinstantiation* / *assemblyinstantiation* element,
3. (N/A for *factoryparam* values) The value or default value, if any, from the component's SPD using the properties precedence stated in D-1.6.1.

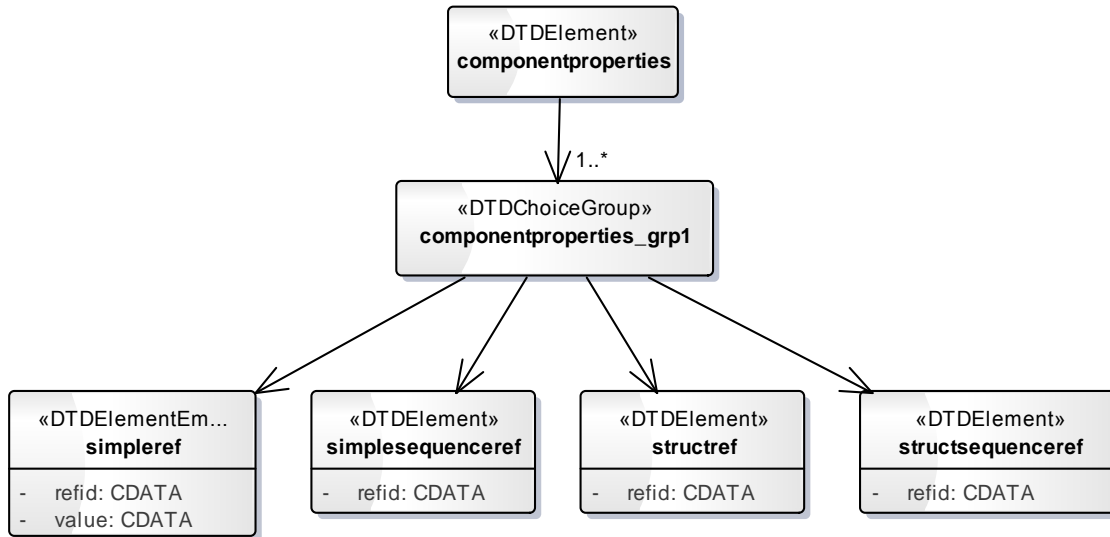


Figure 27: *componentproperties* Element Relationships

```

<!ELEMENT componentproperties
  ( simpleref | simplesequenceref | structref |
    structsequenceref )+ >
  
```

D-1.10.1.3.3.1.2 deviceassignments

The optional *deviceassignments* element provides a list of *deviceassignment* elements which are used when deploying the sub-application's components.

In a *deviceassignment* element, the *componentid* attribute refers to the *componentinstantiationref* within the scope of the sub-application being created, while the *assignedDeviceid* refers a device identifier (Device Configuration Descriptor (DCD) *componentinstantiation id*) in the domain.

```

<!ELEMENT deviceassignments
  ( deviceassignment )+>
<!ELEMENT deviceassignment EMPTY>
<!-- ATTLIST deviceassignment
  componentid          CDATA          #REQUIRED
  assignedDeviceid     CDATA          #REQUIRED -->
  
```

D-1.10.1.3.3.1.3 deploymentdependencies

The *deploymentdependencies* element (described generically in section D-1.10.1.3.3.1.4) overrides referenced SAD dependencies.

D-1.10.1.3.3.1.4 executionaffinityassignments

The optional *executionaffinityassignments* element provides a list of *executionaffinityassignment* elements which are used when deploying the sub-application's components.

The *executionaffinityassignment* element *componentid* attribute refers to a *componentinstantiationref* element within the scope of the sub-application being created. The optional *processcollocation* attribute indicates the logical process in which the component instance must be executed. The *processcollocation* attribute is used within the options parameter of the *ExecutableInterface::execute* operation. The optional *coreaffinity* element indicates a preferred processor core for execution of the sub-application component instances. The *coreaffinity* element is used within the options parameter of the *ExecutableInterface::execute* operation.

```
<!ELEMENT executionaffinityassignments
  ( executionaffinityassignment+
)>
<!ELEMENT executionaffinityassignment
  ( coreaffinity*
)>
<!ATTLIST executionaffinityassignment
  componentid CDATA #REQUIRED
  processcollocation CDATA #IMPLIED>
```

D-1.10.1.4 deploymentdependencies

The *deploymentdependencies* element (see Figure 28) is cited in multiple places within the SAD. It supplies, within its governing scope, overriding values for like-named dependencies defined within the scope. This allows the addition of scope-dependent deployment information, e.g. specification of a particular radio channel or security domain for the deployed application, sub-application or component. Each *dependencies* element is a *propertyref* referencing a property of *kind* "allocation", and overrides any values from

- narrower-scope *deploymentdependencies*,
- SPD-defined *dependency propertyref* elements (see section D-1.6.1.6.10.2),
- SPD-defined *usesdevice propertyref* elements (see section D-1.6.1.6.11.1).

When, for any *componentinstantiation*, there are no matching dependencies (same id) specified in the SPD file, then the *deploymentdependencies*-supplied *propertyref* is not used to constrain deployment. In this way, dependencies can be overridden where they are specified, while not imposing new dependencies where they are not intended.

Deployment dependencies precedence order in order of highest to lowest is:

1. *Application Factory::create deploymentdependencies* parameter,
2. *Assemblyinstantiation deploymentdependencies*,
3. *Componentinstantiation deploymentdependencies*,
4. SAD deployment *deploymentdependencies*,
5. *Componentinstantiation* SPD *dependency* and *usesdevice*.

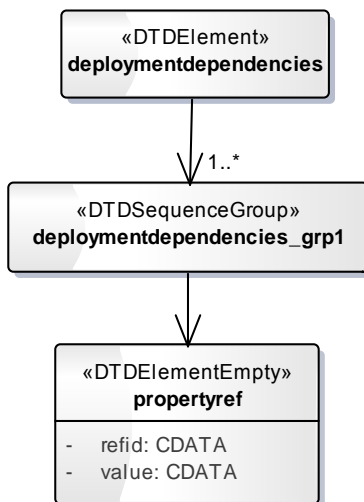


Figure 28: *deploymentdependencies* Element Relationships

```

<!ELEMENT deploymentdependencies
  (propertyref
  ) +>
  
```

D-1.10.1.5 assemblycontroller

The *assemblycontroller* element (see Figure 29) indicates the *componentinstantiation* and / or *assemblyinstantiation*(s) that form the control point(s) for the assembly. The *ApplicationManagerComponent* delegates its *configure*, *query*, *start*, *stop*, and *runTest* operations to the elements identified by the *assemblycontroller* element.

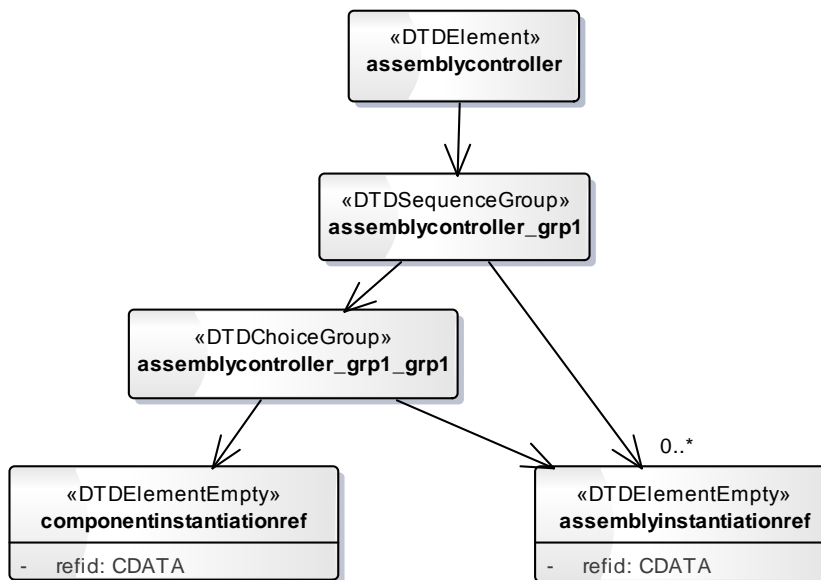


Figure 29: *assemblycontroller* Element Relationships

```
<!ELEMENT assemblycontroller
  (( componentinstantiationref | assemblyinstantiationref),
  assemblyinstantiationref* )>
```

D-1.10.1.6 connections

The *connections* element is a child element of the *softwareassembly* element. The *connections* element is intended to provide the connection map between components in the assembly.

```
<!ELEMENT connections
  ( connectinterface* )>
```

D-1.10.1.6.1 connectinterface

The *connectinterface* element (see Figure 30) is used when application components are being assembled to describe connections between their port interfaces. The *connectinterface* element consists of a *usesport* element and a *providesport* or *componentsupportedinterface* element. These elements are intended to connect two compatible components. The *connectinterface* element's *id* attribute is a unique identifier for the connection interface definition within the Domain Profile.

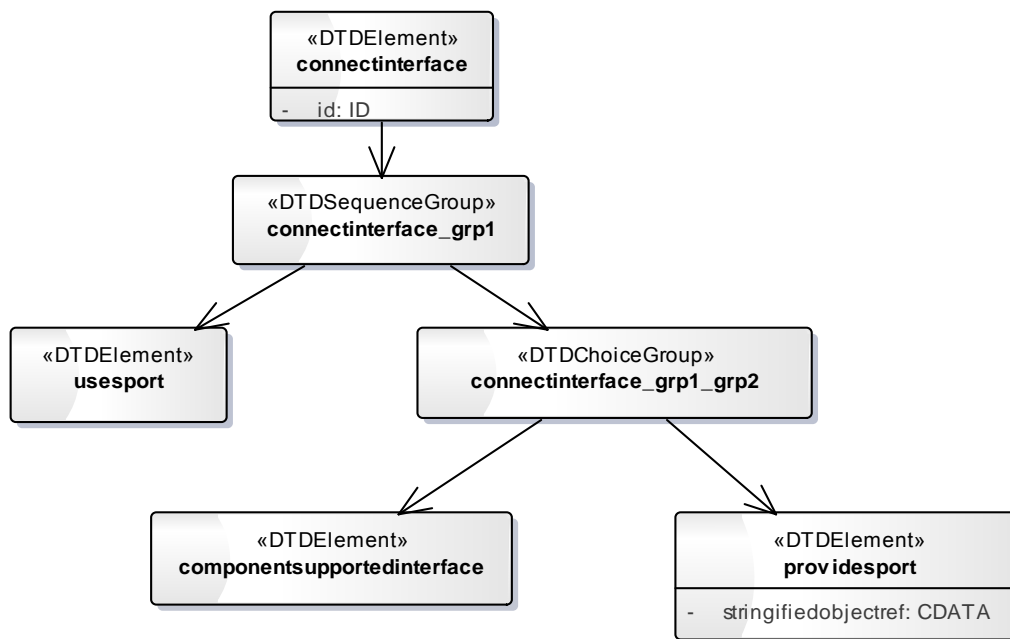


Figure 30: *connectinterface* Element Relationships

```

<!ELEMENT connectinterface
  ( usesport
    , ( providesport | componentsupportedinterface )
  )>
<!--ATTLIST connectinterface
  id ID #IMPLIED-->

```

D-1.10.1.6.1.1 *usesport*

The *usesport* element (see Figure 31) identifies, using the *identifier* element, the component port that is using the provided interface from the *providesport* element. A BaseComponent may be referenced by one of five elements: *componentinstantiationref*, *assemblyinstantiationref*, *domainfinder*, *devicethatloadedthiscomponentref*, and *deviceusedbythiscomponentref*.

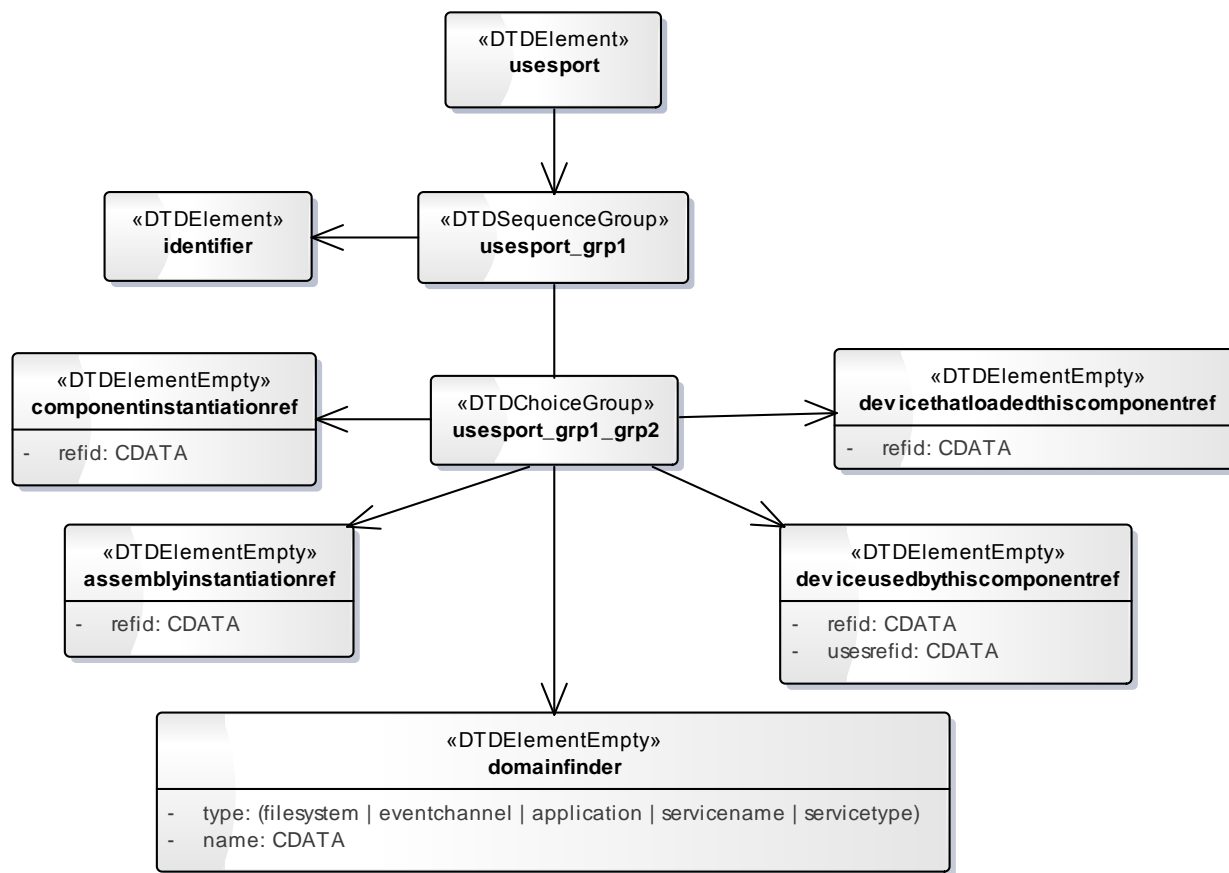


Figure 31: *usesport* Element Relationships

```
<!--ELEMENT usesport
    (identifier
    , ( componentinstantiationref |
      assemblyinstantiationref |
      devicethatloadedthiscomponentref |
      deviceusedbythiscomponentref |
      domainfinder )
    )>
```

D-1.10.1.6.1.1.1 identifier

The *identifier* element identifies which "uses port" on the component is to participate in the connection relationship. This identifier will correspond with an *id* for one of the component ports specified in the SCD.

```
<!--ELEMENT identifier (#PCDATA)>
```

D-1.10.1.6.1.1.2 componentinstantiationref

The *componentinstantiationref* element refers to the *id* attribute of the *componentinstantiation* element within the SAD file. The *refid* attribute will correspond to the unique *componentinstantiation id* attribute.

```
<!--ELEMENT componentinstantiationref EMPTY>
<!--ATTLIST componentinstantiationref
    refid          CDATA          #REQUIRED>
```

D-1.10.1.6.1.1.3 assemblyinstantiationref

The *assemblyinstantiationref* element refers to the *id* attribute of the *assemblyinstantiation* element within the SAD file. The *refid* attribute will correspond to the unique *assemblyinstantiation id* attribute.

```
<!--ELEMENT assemblyinstantiationref EMPTY>
<!--ATTLIST assemblyinstantiationref
    refid          CDATA          #REQUIRED>
```

D-1.10.1.6.1.1.4 devicethatloadedthiscomponentref

The *devicethatloadedthiscomponentref* element refers to a specific component found in the assembly, which is used to obtain the DeviceComponent that was used to load the referenced component from the ApplicationFactoryComponent. The DeviceComponent obtained is then associated with this component instance.

```
<!--ELEMENT devicethatloadedthiscomponentref EMPTY>
<!--ATTLIST devicethatloadedthiscomponentref
    refid          CDATA          #REQUIRED>
```

D-1.10.1.6.1.1.5deviceusedbythiscomponentref

The *deviceusedbythiscomponentref* element refers to a specific component, within the assembly, which is used to obtain the DeviceComponent (e.g., logical device) that is being used by the specific component from the ApplicationFactoryComponent. This relationship is needed when a component is pushing or pulling data and/or commands to another component that exists in the system such as an audio device.

```
<!ELEMENT deviceusedbythiscomponentref EMPTY>
<!--ATTLIST deviceusedbythiscomponentref
      refid          CDATA          #REQUIRED
      usesrefid      CDATA          #REQUIRED-->
```

D-1.10.1.6.1.1.6domainfinder

The *domainfinder* element is used to indicate to the ApplicationFactoryComponent the necessary information to find an object reference that is of specific type and may also be known by an optional name within the domain. The valid *type* attributes are "filesystem", "eventchannel", "application", "servicename", and "servicetype".

For "filesystem" type when *name* attribute is not supplied then the closest FileSystemComponent proximity-wise (e.g. file system residing on the same physical device as the component on the other end of the connection would be used first) is provided.

The *type* attribute value of "eventchannel" is used to specify the event channel to be used in the OE's Event Service for producing or consuming events. If the *name* attribute is not supplied and the *type* attribute has a value of "eventchannel" then the Incoming domain management event channel is used.

For "application" type the *name* attribute must be specified. For "application" type the *name* attribute format is ApplicationFactoryComponent name followed by forward slash "/" followed by Application name (e.g. "the_applicationfactory_name/the_application_name"). The options for "application" type name and meaning are:

1. When only the application name is specified then any existing ApplicationManagerComponent in the domain with that name can be used;
2. When both the Application Factory name and Application name (e.g. "the_applicationfactory_name/the_application_name") is specified the ApplicationManagerComponent with that name created by the specified Application FactoryComponent is returned;
3. When only the Application Factory name followed by a forward slash is specified then any ApplicationManagerComponent created by the specified ApplicationFactoryComponent with that name can be used.

If "servicename" or "servicetype" is specified then name must be specified. Both values correspond to a service identified in a DeviceMangerComponent's DCD. The DCD *usagename* element contains a value in an "identifier\type" format for a component service type. For "servicename" the name corresponds to the "identifier" portion of the *usagename* element. For

"servicetype" the name corresponds to the "type" portion of the *usagename* element. The *type* attribute value of "servicename" is used to locate registered ServiceComponents on a per name basis. The *type* attribute value of "servicetype" is used to locate registered ServiceComponents on a per type basis.

```
<!ELEMENT domainfinder EMPTY>
<!ATTLIST domainfinder
    type (filesystem | eventchannel | application | servicename
        | servicetype) #REQUIRED
    name CDATA #IMPLIED>
```

D-1.10.1.6.1.2 *providesport*

The *providesport* element (see Figure 32) identifies, using the *identifier* element, the component port that is provided to a *usesport* within the *connectinterface* element. A BaseComponent may be referenced by one of five elements: *componentinstantiationref*, *assemblyinstantiationref*, *domainfinder*, *devicethatloadedthiscomponentref*, and *deviceusedbythiscomponentref*. The *domainfinder* element by itself is used when the component is not manageable via the CF interfaces. The *providesport* element's *stringifiedobjectref* attribute, when specified, is the component instantiation provides port object reference that does not require component registration but still requires dynamic connections

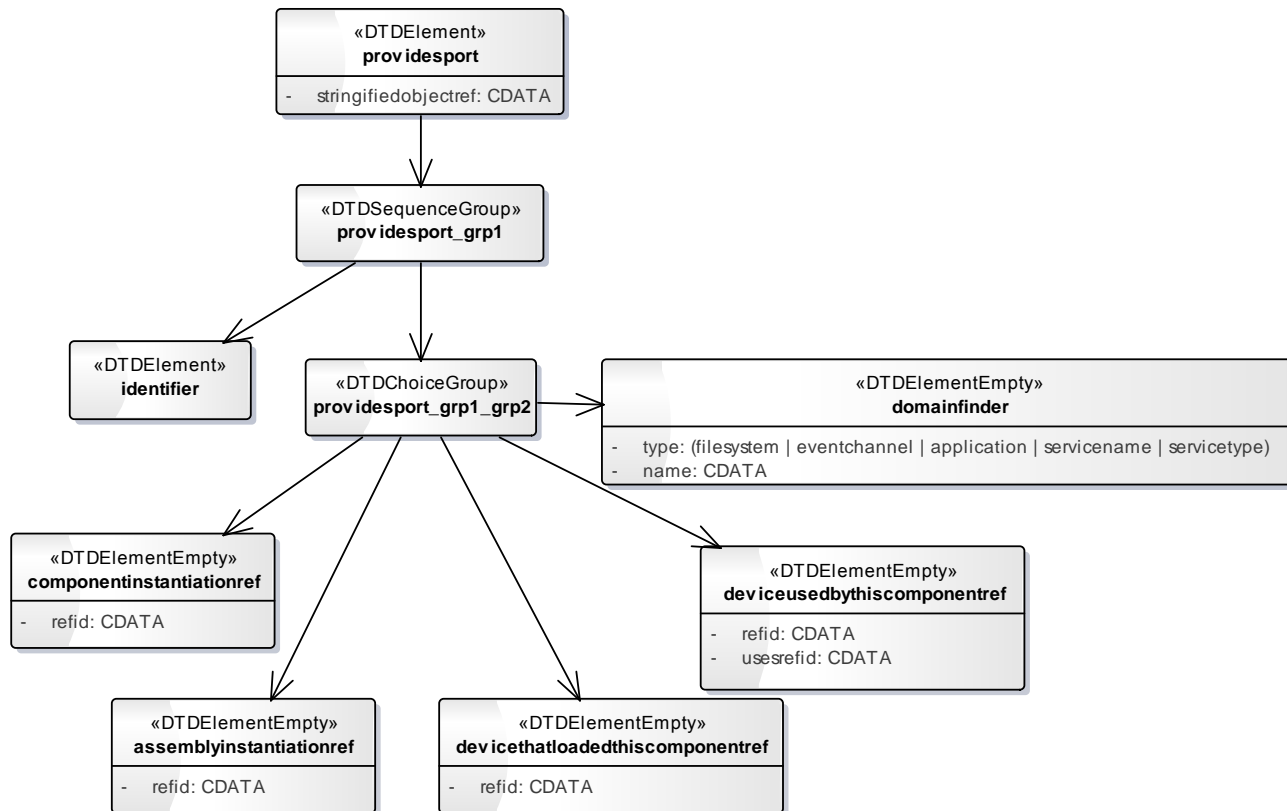


Figure 32: *providesport* Element Relationships

```

<!ELEMENT providesport
  (identifier
  , ( componentinstantiationref |
    assemblyinstantiationref |
    devicethatloadedthiscomponentref |
    deviceusedbythiscomponentref | domainfinder )
  )>
<!ATTLIST providesport
  stringifiedobjectref CDATA #IMPLIED>

```

D-1.10.1.6.1.2.1 identifier

The *identifier* element identifies which "provides port" on the component is to participate in the connection relationship. This identifier will correspond with a *repid* attribute for one of the component ports elements, specified in the SCD.

```
<!ELEMENT identifier (#PCDATA)>
```

D-1.10.1.6.1.2.2 componentinstantiationref

See D-1.10.1.6.1.1.2 for a description of the *componentinstantiationref* element.

D-1.10.1.6.1.2.3 assemblyinstantiationref

See D-1.10.1.6.1.1.3 for a description of the *assemblyinstantiationref* element.

D-1.10.1.6.1.2.4 devicethatloadedthiscomponentref

See D-1.10.1.6.1.1.4 for a description of the *devicethatloadedthiscomponentref* element.

D-1.10.1.6.1.2.5 deviceusedbythiscomponentref

See D-1.10.1.6.1.1.5 for a description of the *deviceusedbythiscomponentref* element.

D-1.10.1.6.1.2.6 domainfinder

See section D-1.10.1.6.1.1.6 for a description of the *domainfinder* element.

D-1.10.1.6.1.3 componentsupportedinterface

The *componentsupportedinterface* element (see Figure 33) specifies a component, which has a *supportsinterface* element that can satisfy an interface connection to a port specified by the *usesport* element, within a *connectinterface* element. A component within the assembly may be referenced by one of four elements: *componentinstantiationref*, *domainfinder*, *devicethatloadedthiscomponentref*, and *deviceusedbythiscomponentref*. The *componentinstantiationref* identifies a component within the assembly. The *domainfinder* element points to an existing component that can be found within a DomainManagerComponent.

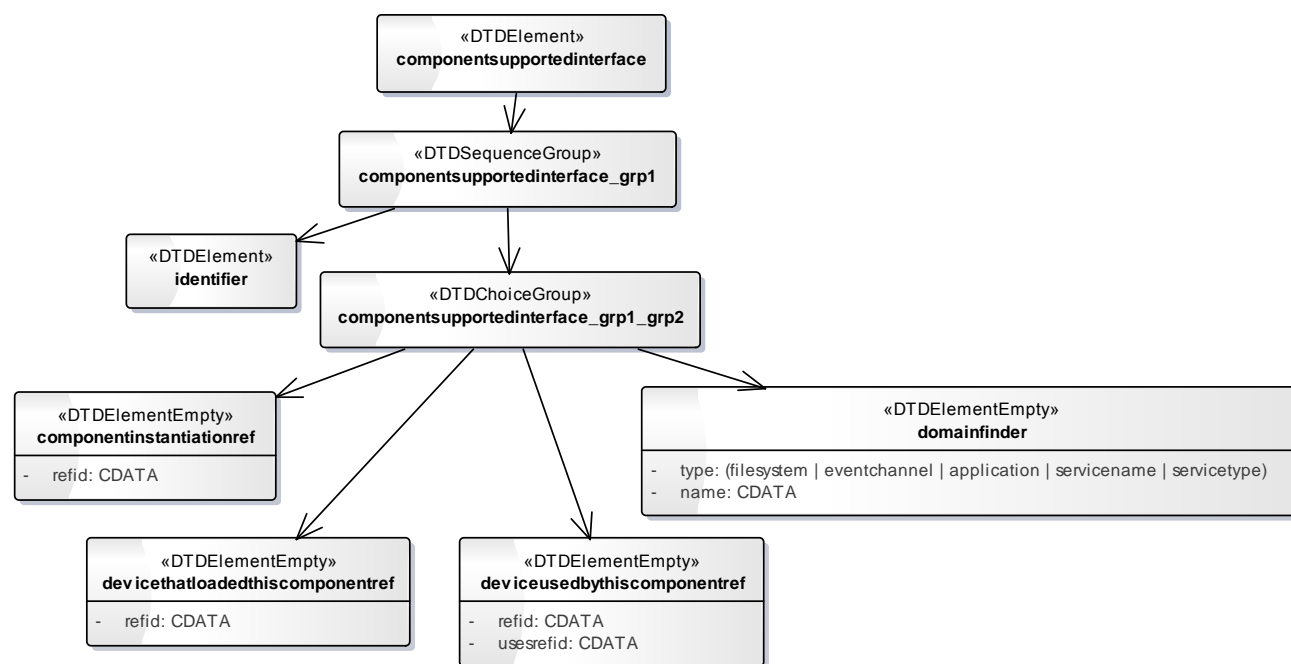


Figure 33: *componentsupportedinterface* Element Relationships

```

<!ELEMENT componentsupportedinterface
(identifier
  , ( componentinstantiationref |
    devicethatloadedthiscomponentref |
    deviceusedbythiscomponentref | domainfinder)
)>
  
```

D-1.10.1.6.1.3.1 identifier

The *identifier* element identifies which supported interface on the component is to participate in the connection relationship. This identifier will correspond with the *refid* attribute of one of the component's *supportsinterface* elements, specified in the SCD.

```

<!ELEMENT identifier (#PCDATA)>
  
```

D-1.10.1.6.1.3.2 componentinstantiationref

See section D-1.10.1.6.1.1.2 for a description of the *componentinstantiationref* element.

D-1.10.1.6.1.3.3 domainfinder

See section D-1.10.1.6.1.1.6 for a description of the *domainfinder* element.

D-1.10.1.7 externalports

The optional *externalports* element (see Figure 34) is a child element of the *softwareassembly* element (see Figure 19). The *externalports* element is used to identify the visible ports for the

software assembly. The *ApplicationManager::getProvidesPorts* operation is used to access the assembly's obtainable provides ports.

The *usesidentifier* element identifies which supported interface of the software assembly is to participate in the connection relationship. This identifier will correspond with an *identifier* element from one of the assembly component's *usesport* definitions.

The *providesidentifier* element identifies which supported interface of the software assembly is to participate in the connection relationship. This identifier will correspond with an *identifier* element from one of the assembly component's *providesport* definitions.

The *supportedidentifier* element identifies which supported interface of the software assembly is to participate in the connection relationship. This identifier will correspond with an *identifier* element from one of the assembly component's *componentsupportedinterface* definitions.

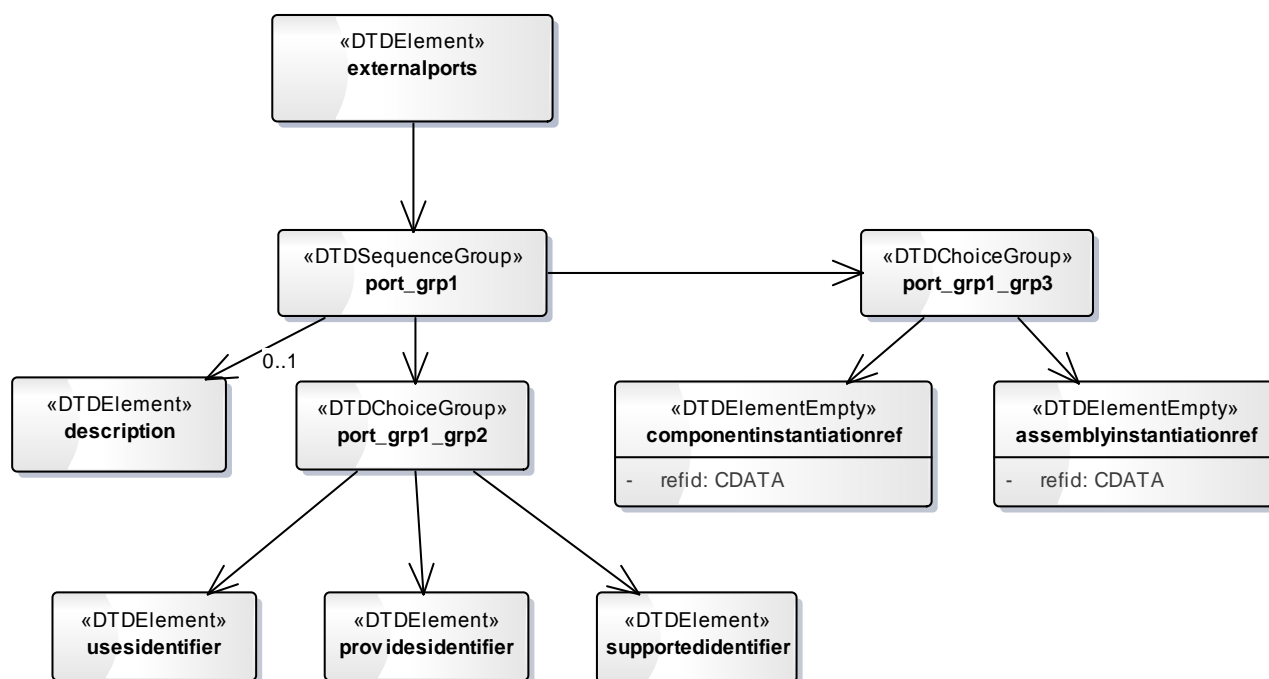


Figure 34: *externalports* Element Relationships

```
<!ELEMENT externalports
  ( port+
  )>
<!ELEMENT port
  ( description?
  , ( usesidentifier | providesidentifier |
    supportedidentifier)
  , (componentinstantiationref | assemblyinstantiationref)
  )>

<!ELEMENT usesidentifier (#PCDATA)>
<!ELEMENT providesidentifier (#PCDATA)>
<!ELEMENT supportedidentifier (#PCDATA)>
```

D-1.10.1.8 deploymentprefs

The optional *deploymentprefs* element is a reference to a local file. See section D-1.6.1.4.1 for the definition of the *localfile* element. The file refers to an Application Deployment Descriptor (ADD) file.

```
<!ELEMENT deploymentprefs
    ( localfile
    )>
```

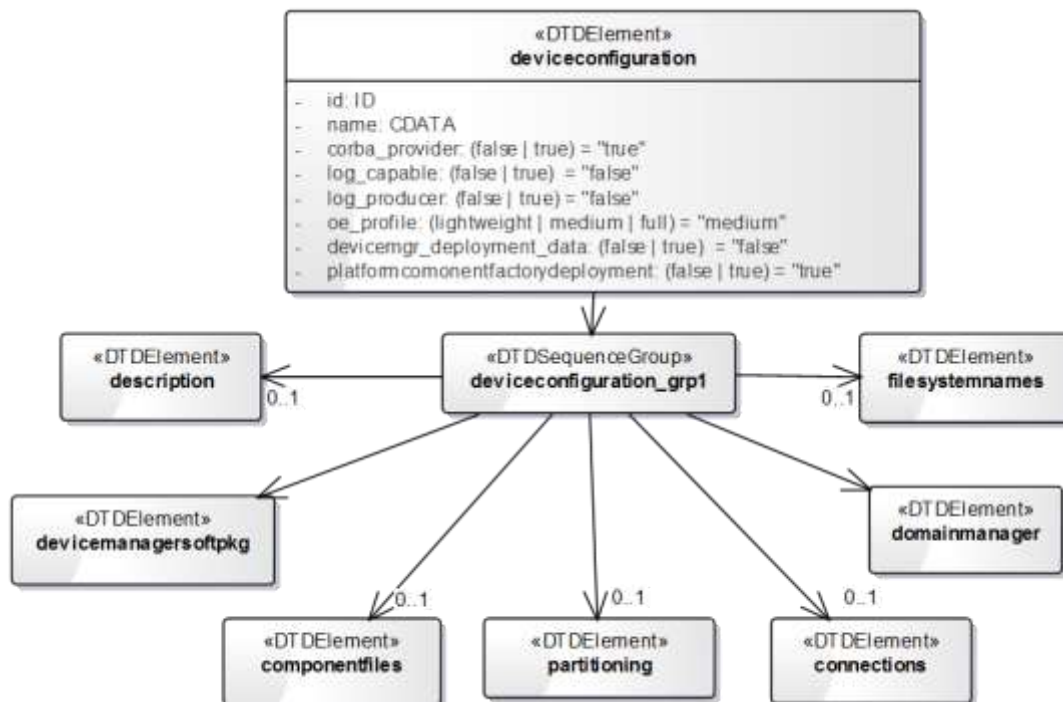
D-1.11 DEVICE CONFIGURATION DESCRIPTOR

This section describes the XML elements of the Device Configuration Descriptor (DCD) XML file; the *deviceconfiguration* element (see Figure 35). The DCD is based on the SAD (e.g., componentfiles, partitioning, etc.) DTD. The intent of the DCD is to provide the means of describing the components that are initially started on the DeviceManagerComponent node, how to obtain the DomainManagerComponent reference, connections of services to components (DeviceComponents, DeviceManagerComponent), and the characteristics (file system names, etc.) for a DeviceManagerComponent. The *componentfiles* and *partitioning* elements are optional; if not provided, that means no components are started up on the node, except for a DeviceManagerComponent. If the *partitioning* element is specified then a *componentfiles* element has to be specified also.

SCA497 A Device Configuration Descriptor file shall have a ".dcd.xml" extension.

D-1.11.1 deviceconfiguration

The *deviceconfiguration* element's *id* attribute is a unique identifier within the domain for the device configuration. This *id* attribute is a unique identifier within the Domain Profile for the device configuration. The *name* attribute is the user-friendly name for the DeviceManagerComponent's *label* attribute. The *corba_provider*, *log_capable*, *log_producer*, *devicemgr_deployment_data* and *platformcomponentfactorydeployment* attributes represent the optional Units of Functionality (UOF) supported by the DeviceManagerComponent. The *oe_profile* attribute is the operating environment profile supported by the DeviceManagerComponent.

Figure 35: *deviceconfiguration* Element Relationships

```

<!ELEMENT deviceconfiguration
  ( description?
  , devicemanagersoftpkg
  , componentfiles?
  , partitioning?
  , connections?
  , domainmanager
  , filesystemnames?
  )>
<!ATTLIST deviceconfiguration
  id          ID          #REQUIRED
  name        CDATA       #IMPLIED
  corba_provider (false | true) "true"
  log_capable  (false | true) "false"
  log_producer (false | true) "false"
  oe_profile   (lightweight| medium | full) "medium"
  devicemgr_deployment_data      (false | true) "false"
  platformcomponentfactorydeployment (false | true)
  "true">
  
```

D-1.11.1.1 description

The optional *description* element, of the *deviceconfiguration* element, may be used to provide information about the device configuration.

```
<!ELEMENT description (#PCDATA)>
```

D-1.11.1.2 devicemanagersoftpkg

The *devicemanagersoftpkg* element refers to the SPD for the DeviceManagerComponent that corresponds to this DCD. The SPD file is referenced by a *localfile* element. The SPD describes the DeviceManagerComponent and can be used to specify the *usesports* for the services (e.g. Log(s), etc.) that the DeviceManagerComponent uses. See section D-1.6.1.4.1 for a description of the *localfile* element. The optional *componentproperties* element is a list of configure and/or execparam properties values that are used in creating the DeviceManagerComponent. The following sources will be searched in the given precedence order for initial values for *simple* properties with a kindtype of "execparam" or "configure" and a mode attribute of "readwrite" or "writeonly":

1. The DCD *devicemanagersoftpkg* element,
2. The value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

```
<!ELEMENT devicemanagersoftpkg
  ( localfile
    , componentproperties?
  )>
```

D-1.11.1.3 componentfiles

The optional *componentfiles* element is used to reference deployment information for components that are started up on the device. The *componentfile* element references a SPD. The SPD, for example, can be used to describe DeviceComponents, a DeviceManagerComponent, a DomainManagerComponent, and FileSystemComponents. The XML definition of the DCD's *componentfiles* element is the same as the one provided in the SAD's section D-1.10.1.2, see section D-1.10.1.2 for the XML definition of the *componentfiles* element.

D-1.11.1.4 partitioning

The optional *partitioning* element consists of a set of *componentplacement* elements. A component instantiation is captured inside a *componentplacement* element.

```
<!ELEMENT partitioning
  ( componentplacement )*>
```

D-1.11.1.4.1 componentplacement

The *componentplacement* element (see Figure 36) is used to define a particular deployment of a component. The *componentfileref* element identifies the component to be deployed. The

componentinstantiation element identifies the actual component created. Multiple components of the same kind can be created within the same *componentplacement* element.

The optional *deployondevice* element indicates the device on which the *componentinstantiation* element is deployed. The optional *compositepartofdevice* element indicates the parent device of the *componentinstantiation* element. When the component is a logical device, the optional *devicepkgfile* element indicates the hardware device information for the logical device.

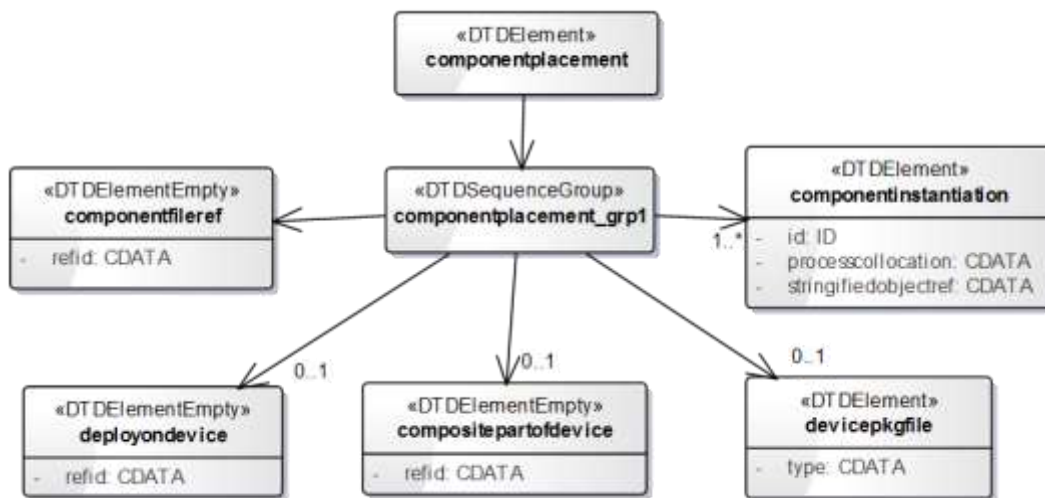


Figure 36: *componentplacement* Element Relationships

```
<!ELEMENT componentplacement
  ( componentfileref
  , deployondevice?
  , compositepartofdevice?
  , devicepkgfile?
  , componentinstantiation+
  )>
```

D-1.11.1.4.1.1 *componentfileref*

The *componentfileref* element is used to reference a *componentfile* element within the *componentfiles* element. The *componentfileref* element's *refid* attribute corresponds to a *componentfile* element's *id* attribute.

```
<!ELEMENT componentfileref EMPTY>
<!ATTLIST componentfileref
  refid      CDATA      #REQUIRED>
```

D-1.11.1.4.1.2 *deployondevice*

The *deployondevice* element is used to reference a *componentinstantiation* element on which this *componentinstantiation* is deployed.

```
<!ELEMENT deployondevice EMPTY>
<!ATTLIST deployondevice
    refid      CDATA      #REQUIRED>
```

D-1.11.1.4.1.3 *compositepartofdevice*

The *compositepartofdevice* element is used when a parent-child relationship exists between devices to reference the *componentinstantiation* element that describes the parent device when this device's *componentinstantiation* element describes the child device.

```
<!ELEMENT compositepartofdevice EMPTY>
<!ATTLIST compositepartofdevice
    refid      CDATA      #REQUIRED>
```

D-1.11.1.4.1.4 *devicepkgfile*

The *devicepkgfile* element is used to refer to a device package file that contains the hardware device definition.

```
<!ELEMENT devicepkgfile
    ( localfile
    )>
<!ATTLIST devicepkgfile
    type CDATA      #IMPLIED>
```

D-1.11.1.4.1.4.1 *localfile*

See D-1.6.1.4.1 for a definition of the *localfile* element.

D-1.11.1.4.1.5 *componentinstantiation*

The *componentinstantiation* element (see Figure 37) is intended to describe a particular instantiation of a component relative to a *componentplacement* element. The *componentinstantiation*'s *id* attribute is an implementation specific value that uniquely identifies the component within the domain. The *componentinstantiation* element's *stringifiedobjectref* attribute, when specified, is the component instantiation object reference that requires dynamic connections. The *usagename* element contains a readable name for the component.

The *usagename* element is required for a component service (e.g., Log Service implementation), and is not used by other platform components. For ServiceComponents, *usagename* must be provided in an "identifier\type" format. The "identifier" portion of the name must be unique for each service instantiation within a domain. The "type" value is common across all instantiations of the same service. The "type" value should be representative of the service that is being provided such as the name or the interfaces. The value "log" represents the type for a Log Service implementation. The *componentinstantiation* element's optional *processcollocation* attribute indicates a specific logical process in which the component instance must be executed. The *processcollocation* attribute is used within the options parameter of the *ExecutableInterface::execute* operation.

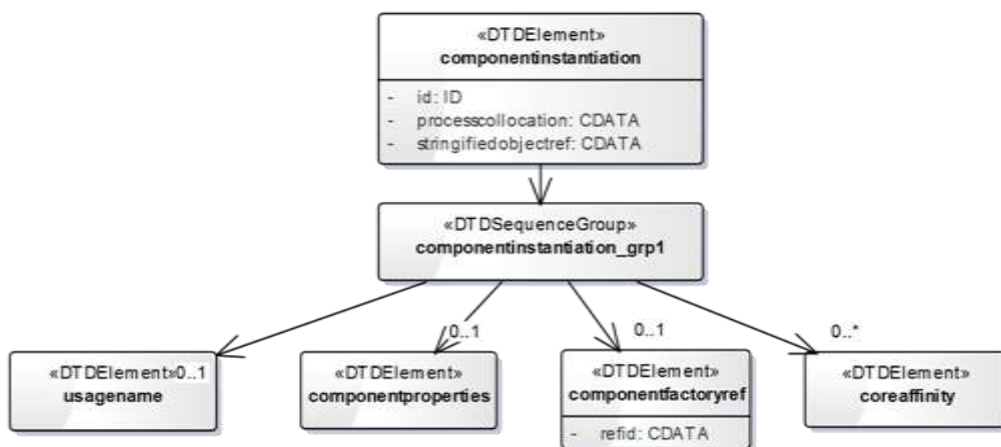


Figure 37: *componentinstantiation* Element Relationships

```

<!ELEMENT componentinstantiation
  ( usagename?
    ,componentproperties?
    ,componentfactoryref?
    ,coreaffinity*
  )>
<!ATTLIST componentinstantiation
  id      ID      #REQUIRED
  processcollocation      CDATA #IMPLIED
  stringifiedobjectref      CDATA #IMPLIED >
<!ELEMENT usagename (#PCDATA)>
  
```

D-1.11.1.4.1.5.1 *componentproperties*

The optional *componentproperties* element (see Figure 38) is a list of configure, factoryparam, and/or execparam properties values that are used in creating the component or for the initial configuration of the component.

The following sources will be searched in the precedence order below for initial values of properties with a *kindtype* of "execparam", "configure" or "allocation" and a *mode* attribute of "readwrite" or "writeonly":

1. The DCD partitioning : componentplacement : componentinstantiation element,
2. The value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

The following sources will be searched in the given precedence order for initial values of properties with a *kindtype* of "factoryparam":

1. The DCD partitioning: componentplacement: componentinstantiation: componentfactoryref: componentfactoryproperties element,

2. The DCD *partitioning: componentplacement: componentinstantiation: componentproperties* element,

3. The value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

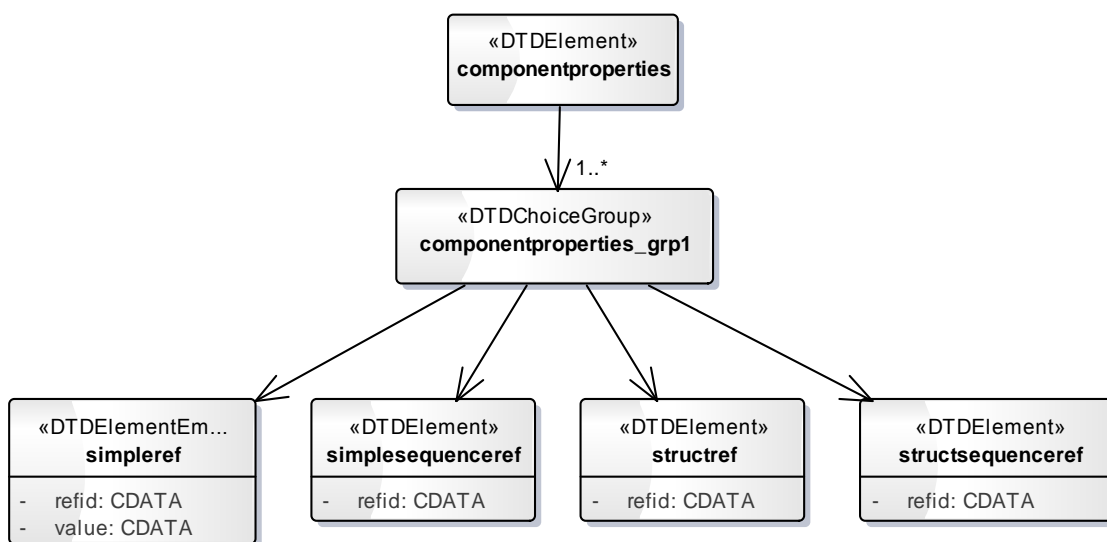


Figure 38: *componentproperties* Element Relationships

```

<!ELEMENT componentproperties
  ( simpleref | simplesequenceref | structref |
    structsequenceref )+ >
  
```

D-1.11.1.4.1.5.2 componentfactoryref

The optional *componentfactoryref* element (see Figure 39) refers to a particular PlatformComponentFactoryComponent *componentinstantiation* element found in the DCD, which is used to obtain a DeviceComponent or ServiceComponent for this *componentinstantiation* element. The *refid* attribute refers to a unique *componentinstantiation id* attribute. The optional *componentfactoryref* element should be specified only when a PlatformComponentFactoryComponent is used to create DeviceComponent or ServiceComponents.

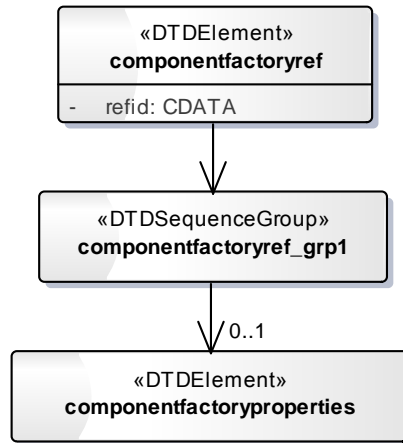


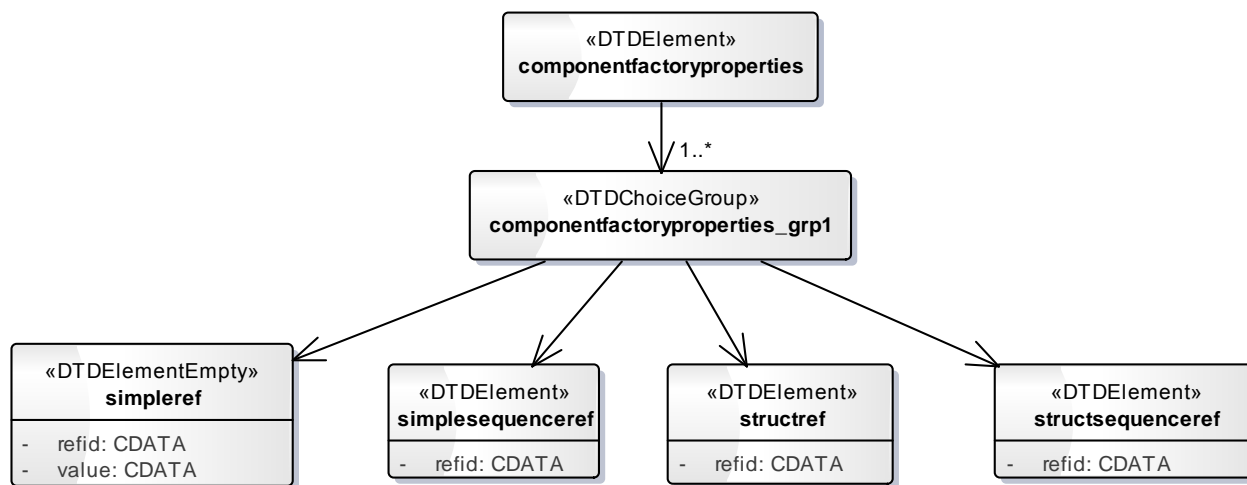
Figure 39: *componentfactoryref* Element Relationships

```

<!ELEMENT componentfactoryref
  ( componentfactoryproperties? )>
<!ATTLIST componentfactoryref
  refid CDATA #REQUIRED>
  
```

D-1.11.1.4.1.5.2.1 componentfactoryproperties

The optional *componentfactoryproperties* element (see Figure 40) specifies the properties "qualifiers", for the PlatformComponentFactoryComponent *createComponent* call.

**Figure 40: *componentfactoryproperties* Element Relationships**

```

<!ELEMENT componentfactoryproperties
( simpleref | simplesequenceref | structref | structsequenceref
)+ >
<!ELEMENT simpleref EMPTY>
<!--LIST simpleref
      refid      CDATA      #REQUIRED
      value      CDATA      #REQUIRED-->
<!ELEMENT simplesequenceref
( values )>
<!--LIST simplesequenceref
      refid      CDATA      #REQUIRED-->
<!ELEMENT structref
( simpleref+ )>
<!--LIST structref
      refid      CDATA      #REQUIRED-->
<!ELEMENT structsequenceref
( structvalue+ )>
<!--LIST structsequenceref
      refid      CDATA      #REQUIRED-->
<!ELEMENT structvalue
( simpleref+ )>
<!ELEMENT values
( value+ )>
<!ELEMENT value (#PCDATA)>

```

D-1.11.1.4.1.5.3 coreaffinity

The optional *coreaffinity* element indicates a preferred processor core for execution of a component instance. The *coreaffinity* element is used within the options parameter of the *ExecutableInterface::execute* operation.

The data type of the *coreaffinity* element is an unsigned long and its value is platform dependent.

```
<!ELEMENT coreaffinity (#PCDATA)>
```

D-1.11.1.5 connections

The *connections* element in the DCD is the same as the *connections* element in the SAD in section D-1.10.1.6. The *connections* element in the DCD is used to indicate the services (Log, etc.) instances that are used by the DeviceManagerComponent and DeviceComponents in the DCD. To establish connections to a DeviceManagerComponent, the DCD's *deviceconfiguration* element's *id* attribute value is used for the SAD's *usesport* element's *componentinstantiationref* element's *refid* attribute value.

D-1.11.1.6 domainmanager

The *domainmanager* element indicates how to register to the DomainManagerComponent. The value of the *name* attribute is based upon the *type* attribute, which could be the name of a file. The *type* attribute indicates the type of mechanism used for obtaining the DomainManagerComponent registration reference such as the *localfile* that contains an ior, ior_string, or resolve_initial_reference.

```
<!ELEMENT domainmanager EMPTY>
<!ATTLIST domainmanager
    name CDATA      #REQUIRED
    type CDATA      #REQUIRED>
```

D-1.11.1.7 filesystemnames

The optional *filesystemnames* element indicates the mounted file system names for DeviceManagerComponent's FileManagerComponent.

The optional *filesystemnames* element indicates the names for file systems mounted within a DeviceManagerComponent's FileManagerComponent. The *mountname* attribute contains a file system name that uniquely identifies a mount point. The *deviceid* attribute is the unique identifier for a specific component, within the DCD, which represents the device hosting this file system. The use of the *deviceid* attribute value is implementation dependent.

```
<!ELEMENT filesystemnames
    ( filesystemname+ )>
<!ELEMENT filesystemname EMPTY>
<!ATTLIST filesystemname
    mountname CDATA      #REQUIRED
    deviceid  CDATA      #REQUIRED>
```

D-1.12 DOMAIN MANAGER CONFIGURATION DESCRIPTOR

This section describes the XML elements of the Domain Manager Configuration Descriptor (DMD) XML file.

SCA498 A DomainManager Configuration Descriptor file shall have a ".dmd.xml" extension.

D-1.12.1 domainmanagerconfiguration

The *domainmanagerconfiguration* element (see Figure 41) *id* attribute is an implementation specific value that uniquely identifies the DomainManagerComponent within the domain. The *app_backwards_compatible*, *app_deployment_data*, *app_installable*, *app_releasable*, *corba_provider*, *channel_extension*, *event_channel*, *log_producer*, and *nested_deployment* attributes represent the optional UOFs supported by the DomainManagerComponent. The *accardinality* attribute indicates whether or not the domain supports multiple application controllers. The *oe_profile* attribute indicates the operating environment profile supported by the DomainManagerComponent.

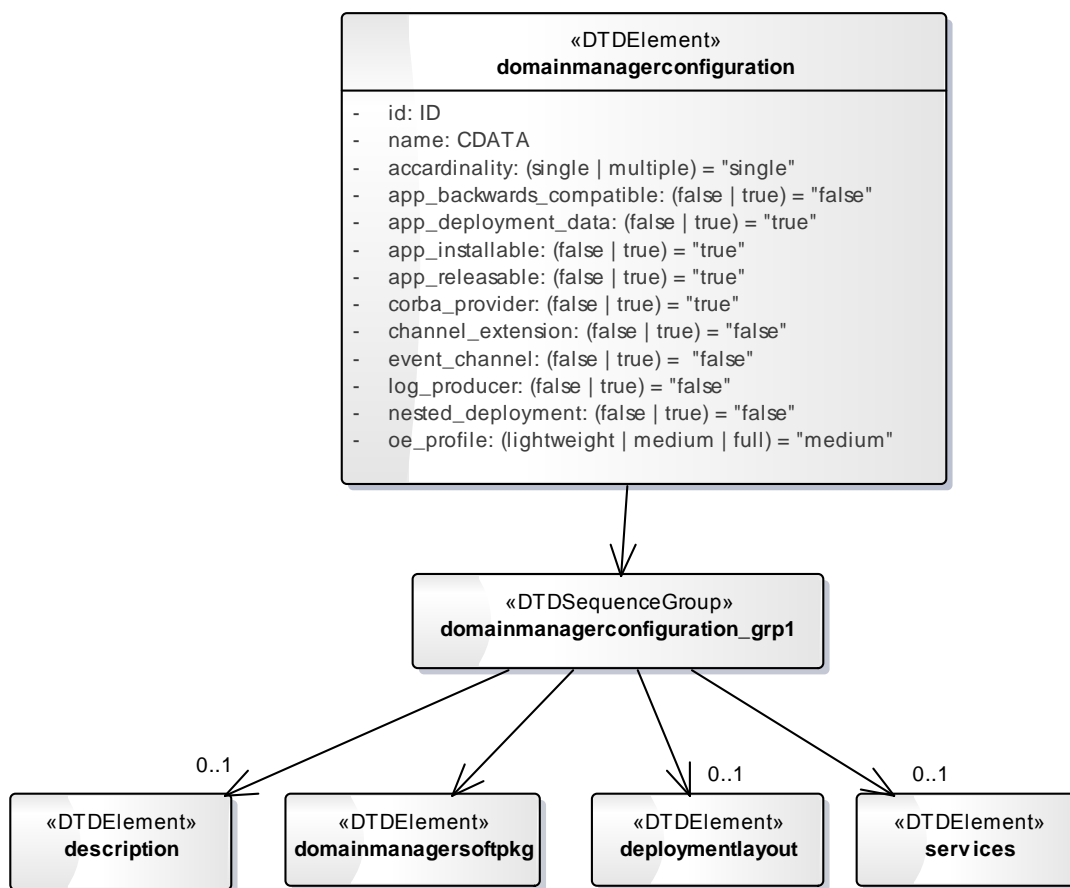


Figure 41: *domainmanagerconfiguration* Element Relationships

```

<!ELEMENT domainmanagerconfiguration
  ( description?
    , domainmanagersoftpkg
    , deploymentlayout?
    , services?
  )>
<!ATTLIST domainmanagerconfiguration
  id      ID      #REQUIRED
  name    CDATA    #REQUIRED
  accardinality (single | multiple) "single"
  app_backwards_compatible (false | true) "false"
  app_deployment_data      (false | true) "true"
  app_installable          (false | true) "true"
  app_releasable           (false | true) "true"
  corba_provider           (false | true) "true"
  channel_extension        (false | true) "false"
  event_channel            (false | true) "false"
  log_producer             (false | true) "false"
  nested_deployment        (false | true) "false"
  oe_profile (lightweight| medium | full) "medium" >

```

D-1.12.1.1 description

The optional *description* element of the DMD may be used to provide information about the configuration.

```
<!ELEMENT description (#PCDATA)>
```

D-1.12.1.2 domainmanagersoftpkg

The *domainmanagersoftpkg* element refers to the SPD for the DomainManagerComponent. The SPD file is referenced by a *localfile* element. This SPD can be used to describe the DomainManagerComponent implementation and to specify the *usesports* for the services (Log(s), etc.) used by the DomainManagerComponent. See section D-1.6.1.4.1 for description of the *localfile* element. The optional *componentproperties* element is a list of configure and/or execparam properties values that are used in creating the DomainManagerComponent. The following sources will be searched in the given precedence order for initial values for *simple* properties with a kindtype of "execparam" or "configure" and a mode attribute of "readwrite" or "writeonly":

1. The DMD *domainmanagersoftpkg* element,
2. The value, if any, from the SPD using the properties precedence stated in D-1.6.1.

If no values are found in the sources above, the property is discarded.

```
<!ELEMENT domainmanagersoftpkg
  ( localfile
    , componentproperties?
  ) >
```

D-1.12.1.3 *deploymentlayout*

The optional *deploymentlayout* element is a reference to a local file. See section D-1.6.1.4.1 for the definition of the *localfile* element. The file refers to a Platform Deployment Descriptor (PDD) file.

```
<!ELEMENT deploymentlayout
  ( localfile
  )>
```

D-1.12.1.4 *services*

The optional *services* element (see Figure 42) in the DMD is used by the DomainManagerComponent to determine which service (e.g. Log, etc.) instances to use; it makes use of the *service* element.

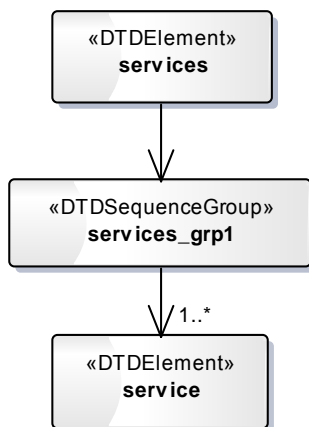
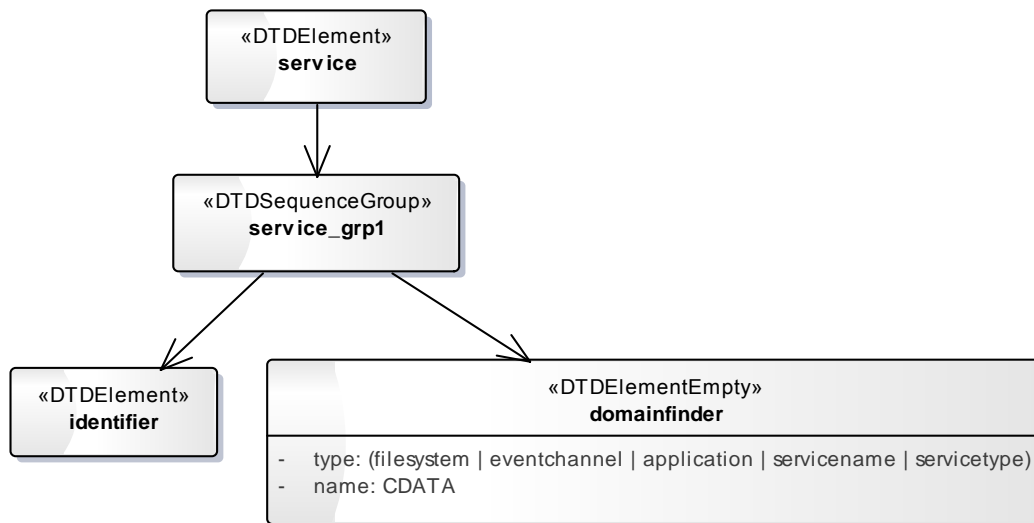


Figure 42: *services* Element Relationships

```
<!ELEMENT services
  ( service+ ) >
```

D-1.12.1.4.1 *service*

The *service* element (see **Figure 43**) defines the service instance. See section D-1.10.1.6.1.1.6 for a description of the *domainfinder* element. See section D-1.10.1.6.1.1.1 for a description of the *identifier* element.

**Figure 43: *service* Element Relationships**

```
<!ELEMENT service
  ( identifier
    , domainfinder )>
```


D-1.13 PLATFORM DEPLOYMENT DESCRIPTOR

This section describes the XML elements of the Platform Deployment Descriptor (PDD) XML file; the *deploymentplatform* element. The intent of the PDD is to provide a means of describing the collection of services and devices that are associated with a virtual channel. The knowledge of the channel composition can be utilized as part of an overall systems engineering strategy to control the allocation of applications to system resources. Another use of the information could be to improve the efficiency of application deployment as the channel elements would be used to constrain the search space for the allocation of individual application components. The use of the PDD is optional within a system, a system designer is free to use allocation properties or other approaches to manage the allocation of application components to platform resources.

SCA499 A Platform Deployment Descriptor file shall have a ".pdd.xml" extension.

D-1.13.1 *deploymentplatform*

The *deploymentplatform* element (see **Figure 44**) contains the layout of the virtual channels within a platform domain.

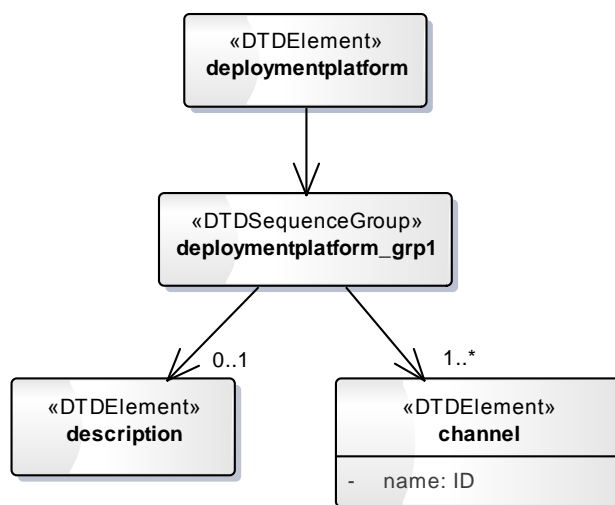


Figure 44: *deploymentplatform* Element Relationships

```

<!ELEMENT deploymentplatform
  ( description?
    , channel+
  ) >
  
```

D-1.13.1.1 *description*

The optional *description* element of the PDD may be used to provide information about the platform domain.

```

<!ELEMENT description (#PCDATA)>
  
```

D-1.13.1.2 channel

The *channel* element (see Figure 45) in the PDD defines the collections of devices and services that are used by an *ApplicationFactoryComponent* as target resource pools for application deployment. The *channel* element's *name* attribute contains the identifier for the channel that is used by the *ApplicationFactoryComponent* and the ADD.

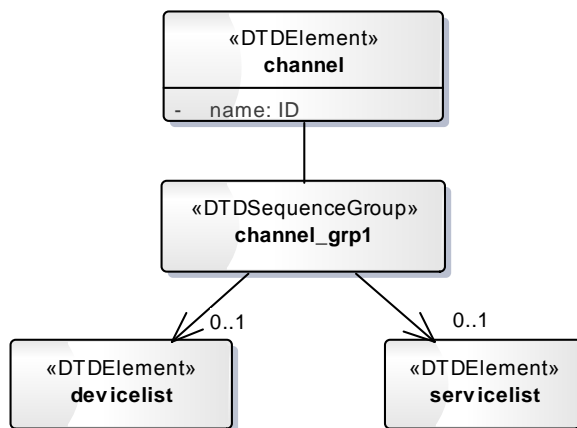


Figure 45: *channel* Element Relationships

```

<!ELEMENT channel
  ( devicelist?
    , servicelist?
  ) >
<!ATTLIST channel
  name ID    #REQUIRED>
  
```

D-1.13.1.2.1 devicelist

The optional *devicelist* element in the PDD defines the collection of devices for a given channel that are used by the *ApplicationFactoryComponent* as target resource pools for application deployment.

```

<!ELEMENT devicelist
  ( deviceref+
  )>
  
```

D-1.13.1.2.1.1 deviceref

The *deviceref* element is used to reference a *componentinstantiation* element which is part of the channel. The *refid* attribute points to a *componentinstantiation identifier* for a device that has registered with the platform.

```
<!--ELEMENT deviceref EMPTY-->
<!--ATTLIST deviceref
      refid          CDATA          #REQUIRED-->
```

D-1.13.1.2servicelist

The optional *servicelist* element in the PDD defines the collection of services for a given channel that are used by the ApplicationFactoryComponent as target resource pools for application deployment.

```
<!--ELEMENT servicelist
      ( serviceref+
      )-->
```

D-1.13.1.2.2.1 serviceref

The *serviceref* element identifies a service which is part of the channel. The *servicename* attribute is identical to the "identifier" portion *usagename* identifier for a service that has registered with the platform (for a component service type *usagename* is provided in an "identifier\type" format).

```
<!--ELEMENT serviceref          EMPTY-->
<!--ATTLIST serviceref
      servicename      CDATA          #REQUIRED-->
```

D-1.14 APPLICATION DEPLOYMENT DESCRIPTOR

This section describes the XML elements of the Application Deployment Descriptor (ADD) XML file; the *deploymentprecedence* element. The intent of the ADD is to provide prioritized lists of deployment alternatives for application instances.

SCA500 An Application Deployment Descriptor file shall have an ".add.xml" extension.

D-1.14.1 *deploymentprecedence*

The *deploymentprecedence* element (see Figure 46) contains the relationship between application instances and their candidate virtual channels.

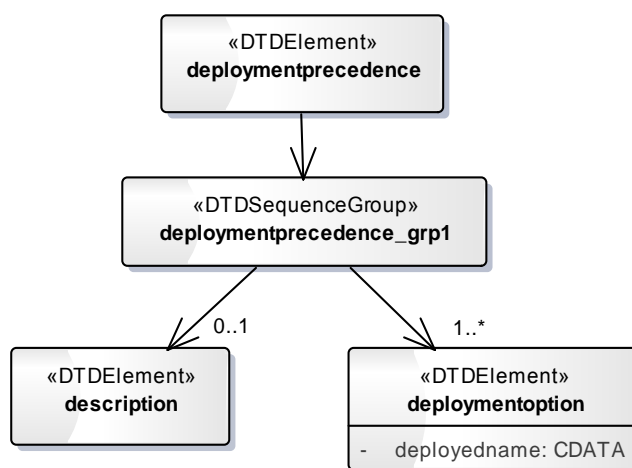


Figure 46: *deploymentprecedence* Element Relationships

```

<!ELEMENT deploymentprecedence
  ( description?
    , deploymentoption+
  ) >
  
```

D-1.14.1.1 *description*

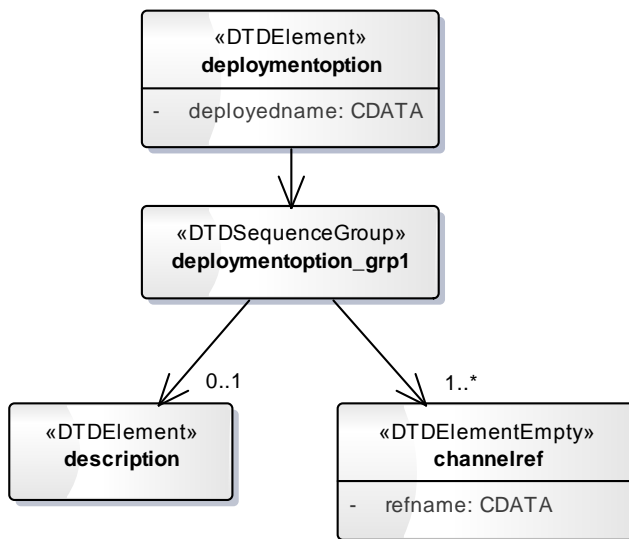
The optional *description* element of the ADD may be used to provide information about the application.

```

<!ELEMENT description (#PCDATA)>
  
```

D-1.14.1.2 *deploymentoption*

The *deploymentoption* element (see Figure 47) in the ADD identifies the ordered list of channels that provide deployment alternatives for a specific application instance. The *deployedname* attribute corresponds to a named application instance (e.g. the name parameter passed to the *ApplicationFactory::create* operation).

**Figure 47: *deploymentoption* Element Relationships**

```

<!ELEMENT deploymentoption
  ( description?
    , channelref+
  )>
<!ATTLIST deploymentoption
  deployedname CDATA #REQUIRED>
  
```

D-1.14.1.2.1description

The optional *description* element may be used to provide information about the application instance.

```

<!ELEMENT description (#PCDATA)>
  
```

D-1.14.1.2.2channelref

The *channelref* element is used to reference a *channel* element from the PDD which provides a deployment alternative. The *refname* attribute points to a *channel* element *name* attribute that identifies a channel.

```

<!ELEMENT channelref EMPTY>
<!ATTLIST channelref
  refname CDATA #REQUIRED>
  
```

D-1.15 ATTACHMENTS

This appendix includes the following:

- Attachment 1: Common Properties Definitions

D-1.16 DOCUMENT TYPE DEFINITION (DTD) FILES**D-1.16.1 softpkg**

```

<!-- softpkg.4.1.dtd -->

<!ELEMENT softpkg
  ( title?
    , author+
    , description?
    , propertyfile?
    , descriptor?
    , implementation+
    , usesdevice*
  )>
<!ATTLIST softpkg
  id          ID          #REQUIRED
  name CDATA          #REQUIRED
  type (sca_compliant | sca_non_compliant) "sca_compliant"
  version    CDATA      #IMPLIED >
<!ELEMENT title (#PCDATA)>
<!ELEMENT author
  ( name*
    , company?
    , webpage?
  )>
<!ELEMENT name      (#PCDATA)>
<!ELEMENT company   (#PCDATA)>
<!ELEMENT webpage   (#PCDATA)>
<!ELEMENT description (#PCDATA)>
<!ELEMENT propertyfile
  ( localfile
  )>
<!ATTLIST propertyfile
  type      CDATA      #IMPLIED>
<!ELEMENT localfile EMPTY>
<!ATTLIST localfile
  name CDATA      #REQUIRED>
<!ELEMENT descriptor
  (localfile
  )>
<!ATTLIST descriptor
  name      CDATA      #IMPLIED>
<!ELEMENT implementation
  ( description?

```

```

    , propertyfile?
    , code
    , compiler?
    , programminglanguage?
    , humanlanguage?
    , runtime?
    , ( os | processor | dependency )+
    , usesdevice*
  )>
<!--ATTLIST implementation
  id ID #REQUIRED
  aepcompliance (aep_compliant | lw_aep_compliant |
    aep_non_compliant) "aep_compliant">
<!--ELEMENT code
  ( localfile
    , entrypoint?
    , stacksize?
    , priority?
  )>
<!--ATTLIST code
  type CDATA #IMPLIED>
<!--ELEMENT entrypoint (#PCDATA)>
<!--ELEMENT stacksize (#PCDATA)>
<!--ELEMENT priority (#PCDATA)>
<!--ELEMENT compiler EMPTY>
<!--ATTLIST compiler
  name CDATA #REQUIRED
  version CDATA #IMPLIED>
<!--ELEMENT programminglanguage EMPTY>
<!--ATTLIST programminglanguage
  name CDATA #REQUIRED
  version CDATA #IMPLIED>
<!--ELEMENT humanlanguage EMPTY>
<!--ATTLIST humanlanguage
  name CDATA #REQUIRED>
<!--ELEMENT runtime EMPTY>
<!--ATTLIST runtime
  name CDATA #REQUIRED
  version CDATA #IMPLIED>
<!--ELEMENT os EMPTY>
<!--ATTLIST os
  name CDATA #REQUIRED
  version CDATA #IMPLIED>
<!--ELEMENT processor EMPTY>
<!--ATTLIST processor

```



```

        name CDATA      #REQUIRED>
<!--ELEMENT dependency
      ( softpkgref | propertyref )>
<!--ATTLIST dependency
      type CDATA      #REQUIRED>
<!--ELEMENT softpkgref
      ( localfile
        , implref?
      )>
<!--ELEMENT implref EMPTY>
<!--ATTLIST implref
      refid CDATA      #REQUIRED>
<!--ELEMENT propertyref EMPTY>
<!--ATTLIST propertyref
      refid CDATA      #REQUIRED
      value CDATA      #REQUIRED>
<!--ELEMENT usesdevice
      ( propertyref+ )>
<!--ATTLIST usesdevice
      id ID          #REQUIRED
      type CDATA      #REQUIRED>

```

D-1.16.2 devicepkg

```

<!-- devicepkg.4.1.dtd -->

<!ELEMENT devicepkg
  ( title?
    , author+
    , description?
    , hwdeviceregistration
  )>
<!ATTLIST devicepkg
  id          ID          #REQUIRED
  name        CDATA       #REQUIRED
  version     CDATA       #IMPLIED>
<!ELEMENT title (#PCDATA)>
<!ELEMENT author
  ( name*
    , company?
    , webpage?
  )>
<!ELEMENT name      (#PCDATA)>
<!ELEMENT company   (#PCDATA)>
<!ELEMENT webpage    (#PCDATA)>
<!ELEMENT description (#PCDATA)>
<!ELEMENT hwdeviceregistration
  ( propertyfile?
    , description
    , manufacturer
    , modelnumber
    , deviceclass
    , childhwdevice*
  )>
<!ATTLIST hwdeviceregistration
  id          ID          #REQUIRED
  name        CDATA       #REQUIRED
  version     CDATA       #IMPLIED>
<!ELEMENT propertyfile
  ( localfile
  )>
<!ATTLIST propertyfile
  type CDATA      #IMPLIED>
<!ELEMENT localfile EMPTY>
<!ATTLIST localfile
  name CDATA      #REQUIRED>
<!ELEMENT manufacturer (#PCDATA)>

```

```
<!ELEMENT modelnumber (#PCDATA)>
<!ELEMENT deviceclass
( class+
)>
<!ELEMENT class (#PCDATA)>
<!ELEMENT childhwdevice
( hwdeviceregistration | devicepkgref )>
<!ELEMENT devicepkgref
( localfile )>
<!ATTLIST devicepkgref
type CDATA #IMPLIED>
```

D-1.16.3 properties

```

<!-- properties.4.1.dtd -->

<!ELEMENT properties
  ( description?
    , (simple | simplesequence | test | struct | structsequence
      )+
  )>
<!ELEMENT simple
  ( description?
    , value?
    , units?
    , range?
    , enumerations?
    , kind*
    , action?
  )>
<!ATTLIST simple
  id      ID          #REQUIRED
  type    ( boolean | char | double | float | short | long |
    objref | octet | string | ulong | ushort ) #REQUIRED
  name    CDATA       #IMPLIED
  mode    ( readonly | readwrite | writeonly) "readwrite">
<!ELEMENT description (#PCDATA)>
<!ELEMENT value (#PCDATA)>
<!ELEMENT units (#PCDATA)>
<!ELEMENT range EMPTY>
<!ATTLIST range
  min     CDATA       #REQUIRED
  max     CDATA       #REQUIRED>
<!ELEMENT enumerations
  ( enumeration+ )>
<!ELEMENT enumeration EMPTY>
<!ATTLIST enumeration
  label   CDATA       #REQUIRED
  value   CDATA       #IMPLIED>
<!ELEMENT kind EMPTY>
<!ATTLIST kind
  kindtype ( allocation | configure | test | execparam |
    factoryparam) "configure">
<!ELEMENT action EMPTY>
<!ATTLIST action
  type    ( eq | ne | gt | lt | ge | le | external ) "external">
<!ELEMENT simplesequence

```

```

        ( description?
        , values?
        , units?
        , range?
        , kind*
        , action?
        )>
<!--ATTLIST simplesequence
      id    ID    #REQUIRED
      type ( boolean | char | double | float | short | long |
      objref | octet | string | ulong | ushort )    #REQUIRED
      name CDATA    #IMPLIED
      mode (readonly | readwrite | writeonly) "readwrite">
<!--ELEMENT values
      ( value+ )>
<!--ELEMENT test
      ( description
      , inputvalue?
      , resultvalue
      )>
<!--ATTLIST test
      id    CDATA    #REQUIRED
      label    CDATA    #IMPLIED>
<!--ELEMENT inputvalue
      ( simple+ )>
<!--ELEMENT resultvalue
      ( simple+ )>
<!--ELEMENT struct
      ( description?
      , simple+
      , configurationkind?
      )>
<!--ATTLIST struct
      id    ID    #REQUIRED
      name CDATA    #IMPLIED
      mode (readonly | readwrite | writeonly) "readwrite">
<!--ELEMENT configurationkind EMPTY>
<!--ATTLIST configurationkind
      kindtype (configure | factoryparam | typedef) "configure">
<!--ELEMENT structsequence
      ( description?
      , structvalue*
      , configurationkind?
      )>
<!--ATTLIST structsequence

```

```
    id          ID          #REQUIRED
    structrefid CDATA       #REQUIRED
    name        CDATA       #IMPLIED
    mode (readonly | readwrite | writeonly) "readwrite">

<!--ELEMENT structvalue
      ( simpleref+ )>

<!--ELEMENT simpleref EMPTY>
<!--ATTLIST simpleref
    refid      CDATA       #REQUIRED
    value      CDATA       #REQUIRED>
```

D-1.16.4 softwarecomponent

```

<!-- softwarecomponent.4.1.dtd -->

<!ELEMENT softwarecomponent
    ( componentrepid
      , componenttype
      , componentfeatures
      , interfaces
      , propertyfile?
    )>
<!ELEMENT componentrepid EMPTY>
<!ATTLIST componentrepid
    repid      CDATA      #REQUIRED>
<!ELEMENT componenttype (#PCDATA)>
<!ELEMENT componentfeatures
    ( supportsinterface*
      , ports
    )>
<!ELEMENT supportsinterface EMPTY>
<!ATTLIST supportsinterface
    repid      CDATA      #REQUIRED
    supportsname CDATA      #REQUIRED>
<!ELEMENT ports
    ( provides | uses ) *
>
<!ELEMENT provides
    ( porttype* )>
<!ATTLIST provides
    repid      CDATA      #REQUIRED
    providesname CDATA      #REQUIRED
    maxconnections CDATA      #REQUIRED>
<!ELEMENT uses
    ( porttype*
    )>
<!ATTLIST uses
    repid      CDATA      #REQUIRED
    usesname    CDATA      #REQUIRED
    maxconnections CDATA      #REQUIRED>
<!ELEMENT porttype EMPTY>
<!ATTLIST porttype
    type ( data | control | responses | test ) #REQUIRED>
<!ELEMENT interfaces
    ( interface+ )>
<!ELEMENT interface

```

```
      ( inheritsinterface*) >
<!--ATTLIST interface
      repid      CDATA      #REQUIRED
      name      CDATA      #REQUIRED>
<!--ELEMENT inheritsinterface EMPTY>
<!--ATTLIST inheritsinterface
      repid      CDATA      #REQUIRED>
<!--ELEMENT propertyfile
      ( localfile
)>
<!--ATTLIST propertyfile
      type      CDATA      #IMPLIED>
<!--ELEMENT localfile EMPTY>
<!--ATTLIST localfile
      name CDATA      #REQUIRED>
```


D-1.16.5 softwareassembly

```

<!-- softwareassembly.4.1.dtd -->

<!ELEMENT softwareassembly
    ( description?
      , componentfiles
      , partitioning
      , deploymentdependencies?
      , assemblycontroller
      , connections?
      , externalports?
      , deploymentprefs?
    )>
<!ATTLIST softwareassembly
    name          ID          #REQUIRED
    sca_version    CDATA      "V4.1"
    version        CDATA      #IMPLIED>
<!ELEMENT description (#PCDATA)>
<!ELEMENT componentfiles
    ( componentfile+ )>
<!ELEMENT componentfile
    ( localfile )>
<!ATTLIST componentfile
    id            ID          #REQUIRED
    type          CDATA      #IMPLIED>
<!ELEMENT localfile EMPTY>
<!ATTLIST localfile
    name CDATA          #REQUIRED>
<!ELEMENT partitioning
    ( componentplacement | hostcollocation |
      assemblyplacement )+>
<!ELEMENT componentplacement
    ( componentfileref
      , componentinstantiation+
    )>
<!ELEMENT componentfileref EMPTY>
<!ATTLIST componentfileref
    refid        CDATA      #REQUIRED>
<!ELEMENT componentinstantiation
    ( componentproperties?
      , coreaffinity*
      , deploymentdependencies?
      , componentfactoryref?
    )>

```

```

<!--ATTLIST componentinstantiation
      id      ID      #REQUIRED
      processcollocation CDATA #IMPLIED
      stringifiedobjectref CDATA #IMPLIED>
<!--ELEMENT coreaffinity (#PCDATA)>
<!--ELEMENT componentfactoryref
      ( componentfactoryproperties? )>
<!--ATTLIST componentfactoryref
      refid      CDATA      #REQUIRED>
<!--ELEMENT componentfactoryproperties
      ( simpleref      | simplesequenceref | structref |
        structsequenceref )+ >
<!--ELEMENT simpleref EMPTY>
<!--ATTLIST simpleref
      refid      CDATA      #REQUIRED
      value      CDATA      #REQUIRED>
<!--ELEMENT simplesequenceref
      ( values )>
<!--ATTLIST simplesequenceref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structref
      ( simpleref+ )>
<!--ATTLIST structref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structsequenceref
      ( structvalue+ )>
<!--ATTLIST structsequenceref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structvalue
      ( simpleref+ )>
<!--ELEMENT values
      ( value+ )>
<!--ELEMENT value (#PCDATA)>
<!--ELEMENT hostcollocation
      ( componentplacement )+>
<!--ATTLIST hostcollocation
      id      ID      #IMPLIED
      name CDATA      #IMPLIED>
<!--ELEMENT assemblyplacement
      ( componentfileref
        , assemblyinstantiation+
      )>
<!--ELEMENT assemblyinstantiation
      ( componentproperties?
        , deviceassignments?

```

```

, deploymentdependencies?
, executionaffinityassignments?
)>
<!--ATTLIST assemblyinstantiation
id ID #REQUIRED>
<!--ELEMENT componentproperties
( simpleref | simplesequenceref | structref |
structsequenceref )+ >
<!--ELEMENT deviceassignments
( deviceassignment )+>
<!--ELEMENT deviceassignment EMPTY>
<!--ATTLIST deviceassignment
componentid CDATA #REQUIRED
assignedDeviceid CDATA #REQUIRED>
<!--ELEMENT deploymentdependencies
(propertyref
)+>
<!--ELEMENT executionaffinityassignments
( executionaffinityassignment+ )>
<!--ELEMENT executionaffinityassignment
( coreaffinity* )>
<!--ATTLIST executionaffinityassignment
componentid CDATA #REQUIRED
processcollocation CDATA #IMPLIED>
<!--ELEMENT propertyref EMPTY>
<!--ATTLIST propertyref
refid CDATA #REQUIRED
value CDATA #REQUIRED>
<!--ELEMENT assemblycontroller
(( componentinstantiationref | assemblyinstantiationref),
assemblyinstantiationref* )>
<!--ELEMENT connections
( connectinterface* )>
<!--ELEMENT connectinterface
( usesport
, ( providesport | componentsupportedinterface )
)>
<!--ATTLIST connectinterface
id ID #IMPLIED>
<!--ELEMENT usesport
(identifier
, ( componentinstantiationref |
assemblyinstantiationref |
devicethatloadedthiscomponentref |
deviceusedbythiscomponentref |

```

```

        domainfinder )
    )>
<!--ELEMENT identifier (#PCDATA)>
<!--ELEMENT componentinstantiationref EMPTY>
<!--ATTLIST componentinstantiationref
        refid      CDATA      #REQUIRED>
<!--ELEMENT assemblyinstantiationref EMPTY>
<!--ATTLIST assemblyinstantiationref
        refid      CDATA      #REQUIRED>
<!--ELEMENT devicethatloadedthiscomponentref EMPTY>
<!--ATTLIST devicethatloadedthiscomponentref
        refid      CDATA      #REQUIRED>
<!--ELEMENT deviceusedbythiscomponentref EMPTY>
<!--ATTLIST deviceusedbythiscomponentref
        refid      CDATA      #REQUIRED
        usesrefid   CDATA      #REQUIRED>
<!--ELEMENT domainfinder EMPTY>
<!--ATTLIST domainfinder
        type (filesystem | eventchannel | application | servicename
        | servicetype) #REQUIRED
        name CDATA      #IMPLIED>
<!--ELEMENT providesport
        (identifier
        , ( componentinstantiationref |
        assemblyinstantiationref |
        devicethatloadedthiscomponentref |
        deviceusedbythiscomponentref | domainfinder )
        )>
<!--ATTLIST providesport
        stringifiedobjectref CDATA #IMPLIED>
<!--ELEMENT componentsupportedinterface
        (identifier
        , ( componentinstantiationref |
        devicethatloadedthiscomponentref |
        deviceusedbythiscomponentref | domainfinder)
        )>
<!--ELEMENT externalports
        ( port+
        )>
<!--ELEMENT port
        ( description?
        , ( usesidentifier | providesidentifier |
        supportedidentifier)
        , (componentinstantiationref | assemblyinstantiationref)
        )>

```

```
<!ELEMENT usesidentifier (#PCDATA)>  
<!ELEMENT providesidentifier (#PCDATA)>  
<!ELEMENT supportedidentifier (#PCDATA)>  
<!ELEMENT deploymentprefs  
  ( localfile  
  )>
```

D-1.16.6 deviceconfiguration

```
<!-- deviceconfiguration.4.1.dtd -->

<!ELEMENT deviceconfiguration
  ( description?
    , devicemanagersoftpkg
    , componentfiles?
    , partitioning?
    , connections?
    , domainmanager
    , filesystemnames?
  )>
<!ATTLIST deviceconfiguration
  id          ID          #REQUIRED
  name        CDATA       #IMPLIED
  corba_provider (false | true) "true"
  log_capable  (false | true) "false"
  log_producer (false | true) "false"
  oe_profile   (lightweight| medium | full) "medium"
```

```

        devicemgr_deployment_data          (false | true) "false"
        platformcomponentfactorydeployment (false | true) "true">
<!--ELEMENT description (#PCDATA)-->
<!--ELEMENT devicemanagersoftpkg
    ( localfile
      , componentproperties?
    )>
<!--ELEMENT localfile EMPTY>
<!--ATTLIST localfile
name CDATA          #REQUIRED>
<!--ELEMENT componentfiles
    ( componentfile+ )>
<!--ELEMENT componentfile
    ( localfile )>
<!--ATTLIST componentfile
    id          ID      #REQUIRED
    type        CDATA   #IMPLIED>
<!--ELEMENT partitioning
    ( componentplacement )*>
<!--ELEMENT componentplacement
    ( componentfileref
      , deployondevice?
      , compositepartofdevice?
      , devicepkgfile?
      , componentinstantiation+
    )>
<!--ELEMENT componentfileref EMPTY>
<!--ATTLIST componentfileref
    refid        CDATA      #REQUIRED>
<!--ELEMENT deployondevice EMPTY>
<!--ATTLIST deployondevice
    refid        CDATA      #REQUIRED>
<!--ELEMENT compositepartofdevice EMPTY>
<!--ATTLIST compositepartofdevice
    refid        CDATA      #REQUIRED>
<!--ELEMENT devicepkgfile
    ( localfile
    )>
<!--ATTLIST devicepkgfile
    type CDATA          #IMPLIED>
<!--ELEMENT componentinstantiation
    ( usagename?
      ,componentproperties?
      ,componentfactoryref?
      ,coreaffinity*

```

```

)>
<!--ATTLIST componentinstantiation
      id      ID      #REQUIRED
      processcollocation      CDATA #IMPLIED
      stringifiedobjectref      CDATA #IMPLIED >
<!--ELEMENT usagename (#PCDATA)>
<!--ELEMENT componentproperties
      ( simpleref | simplesequenceref | structref |
        structsequenceref )+ >
<!--ELEMENT componentfactoryref
      ( componentfactoryproperties? )>
<!--ATTLIST componentfactoryref
      refid CDATA #REQUIRED>
<!--ELEMENT componentfactoryproperties
      ( simpleref | simplesequenceref | structref | structsequenceref
        )+ >
<!--ELEMENT simpleref EMPTY>
<!--ATTLIST simpleref
      refid      CDATA      #REQUIRED
      value      CDATA      #REQUIRED>
<!--ELEMENT simplesequenceref
      ( values )>
<!--ATTLIST simplesequenceref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structref
      ( simpleref+ )>
<!--ATTLIST structref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structsequenceref
      ( structvalue+ )>
<!--ATTLIST structsequenceref
      refid      CDATA      #REQUIRED>
<!--ELEMENT structvalue
      ( simpleref+ )>
<!--ELEMENT values
      ( value+ )>
<!--ELEMENT value (#PCDATA)>
<!--ELEMENT coreaffinity (#PCDATA)>
<!--ELEMENT connections
      ( connectinterface* )>
<!--ELEMENT connectinterface
      ( usesport
        , ( providesport | componentsupportedinterface )
      )>
<!--ATTLIST connectinterface

```



```

        id ID #IMPLIED>
<!ELEMENT usesport
  (identifier
  , ( componentinstantiationref |
    assemblyinstantiationref |
    devicethatloadedthiscomponentref |
    deviceusedbythiscomponentref | domainfinder )
  )>
<!ELEMENT identifier (#PCDATA)>
<!ELEMENT componentinstantiationref EMPTY>
<!ATTLIST componentinstantiationref
  refid CDATA #REQUIRED>
<!ELEMENT assemblyinstantiationref EMPTY>
<!ATTLIST assemblyinstantiationref
  refid CDATA #REQUIRED>
<!ELEMENT devicethatloadedthiscomponentref EMPTY>
<!ATTLIST devicethatloadedthiscomponentref
  refid CDATA #REQUIRED>
<!ELEMENT deviceusedbythiscomponentref EMPTY>
<!ATTLIST deviceusedbythiscomponentref
  refid CDATA #REQUIRED
  usesrefid CDATA #REQUIRED>
<!ELEMENT domainfinder EMPTY>
<!ATTLIST domainfinder
  type (filesystem | eventchannel | application | servicename
  | servicetype) #REQUIRED
  name CDATA #IMPLIED>
<!ELEMENT providesport
  (identifier
  , ( componentinstantiationref |
    assemblyinstantiationref |
    devicethatloadedthiscomponentref |
    deviceusedbythiscomponentref | domainfinder )
  )>
<!ATTLIST providesport
  stringifiedobjectref CDATA #IMPLIED>
<!ELEMENT componentsupportedinterface
  (identifier
  , ( componentinstantiationref |
    devicethatloadedthiscomponentref |
    deviceusedbythiscomponentref | domainfinder)
  )>
<!ELEMENT domainmanager EMPTY>
<!ATTLIST domainmanager
  name CDATA #REQUIRED

```

```
        type CDATA      #REQUIRED>
<!--ELEMENT filesystemnames
      ( filesystemname+ )>
<!--ELEMENT filesystemname EMPTY>
<!--ATTLIST filesystemname
      mountname CDATA      #REQUIRED
      deviceid  CDATA      #REQUIRED>
```

D-1.16.7 domainmanagerconfiguration

```

<!-- domainmanagerconfiguration.4.1.dtd -->

<!ELEMENT domainmanagerconfiguration
  ( description?
    , domainmanagersoftpkg
    , deploymentlayout?
    , services?
  )>
<!ATTLIST domainmanagerconfiguration
  id      ID      #REQUIRED
  name    CDATA    #REQUIRED
  accardinality (single | multiple) "single"
  app_backwards_compatible (false | true) "false"
  app_deployment_data      (false | true) "true"
  app_installable          (false | true) "true"
  app_releasable            (false | true) "true"
  corba_provider            (false | true) "true"
  channel_extension         (false | true) "false"
  event_channel             (false | true) "false"
  log_producer              (false | true) "false"
  nested_deployment         (false | true) "false"
  oe_profile (lightweight| medium | full) "medium" >
<!ELEMENT description (#PCDATA)>
<!ELEMENT domainmanagersoftpkg
  ( localfile
    , componentproperties?
  ) >
<!ELEMENT simpleref EMPTY>
<!ATTLIST simpleref
  refid      CDATA      #REQUIRED
  value      CDATA      #REQUIRED>
<!ELEMENT simplesequenceref
  ( values )>
<!ATTLIST simplesequenceref
  refid      CDATA      #REQUIRED>
<!ELEMENT structref
  ( simpleref+ )>
<!ATTLIST structref
  refid      CDATA      #REQUIRED>
<!ELEMENT structsequenceref
  ( structvalue+ )>
<!ATTLIST structsequenceref
  refid      CDATA      #REQUIRED>

```

```
<!--ELEMENT structvalue
      ( simpleref+ )>
<!--ELEMENT values
      ( value+ )>
<!--ELEMENT value (#PCDATA)>
<!--ELEMENT componentproperties
      ( simpleref | simplesequenceref | structref |
        structsequenceref )+ >
<!--ELEMENT localfile EMPTY>
<!--ATTLIST localfile
name CDATA      #REQUIRED>
<!--ELEMENT deploymentlayout
      ( localfile
        )>
<!--ELEMENT services
      ( service+ ) >
<!--ELEMENT service
      ( identifier
        , domainfinder)>
<!--ELEMENT domainfinder EMPTY>
<!--ATTLIST domainfinder
      type (filesystem | eventchannel | application | servicename
        | servicetype) #REQUIRED
      name CDATA      #IMPLIED>
<!--ELEMENT identifier (#PCDATA)>
```

D-1.16.8 platformdeployment

```
<!-- platformdeployment.4.1.dtd -->

<!ELEMENT deploymentplatform
  ( description?
    , channel+
  ) >
<!ELEMENT description (#PCDATA)>
<!ELEMENT channel
  ( devicelist?
    , servicelist?
  ) >
<!ATTLIST channel
  name ID      #REQUIRED>
<!ELEMENT devicelist
  ( deviceref+
  )>
<!ELEMENT deviceref EMPTY>
<!ATTLIST deviceref
  refid      CDATA      #REQUIRED>
<!ELEMENT servicelist
  ( serviceref+
  )>
<!ELEMENT serviceref      EMPTY>
<!ATTLIST serviceref
  servicename      CDATA      #REQUIRED>
```

D-1.16.9 applicationdeployment

```
<!-- applicationdeployment.4.1.dtd -->

<!ELEMENT deploymentprecedence
    ( description?
      , deploymentoption+
    ) >
<!ELEMENT description (#PCDATA)>
<!ELEMENT deploymentoption
    ( description?
      , channelref+
    )>
<!ATTLIST deploymentoption
    deployedname    CDATA          #REQUIRED>
<!ELEMENT channelref EMPTY>
<!ATTLIST channelref
    refname        CDATA          #REQUIRED>
```