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**Specification for the DAISY Online Delivery Protocol V2.0 Draft**

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Abstract

**Status of this Document**

*This section describes the status of this document at the time of its publication. Other documents may supersede this document. A list of current DAISY publications and the latest revision of this specification can be found in the DAISY projects index at* [*http://www.daisy.org/projects/*](http://www.daisy.org/projects/)*.*

This document was developed by the DAISY Online Working Group as a part of its activities. For a complete list of members at the time of publication, please refer to [Appendix B, *Acknowledgments*](#SEC_AppendixB).

Please report errors in this document and suggestions for future versions of the protocol to the Working Group through the public feedback form available on the DAISY site at <http://www.daisy.org/support/contactus.php>.

The English version of this specification is the only normative version.

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# 1. Introduction

**This section is informative**

The DAISY Online Delivery protocol grew out of the need for DAISY producers to be able to deliver content to clients and users in a timely and cost-effective way. The challenges associated with distributing content in physical mediums make these solutions difficult to implement, cumbersome to maintain and environmentally unfriendly.

Although DAISY Digital Talking Books are the primary component of the DAISY standard, the standard itself is evolving and the need to distribute various types of accessible media is one that is already faced by many members of the DAISY Consortium. As a result, the service architecture development for this protocol was done with the goal of getting ***resources*** from a provider to a reading system, a design principle that should also make the protocol useful as a content delivery mechanism beyond the sphere of accessible publishing.

The second main development objective was to ensure that the protocol was flexible enough to allow it to be customized and tailored to the delivery needs of any individual or organization. The minimal core functionality facilitates the development of simple services that can, for example, allow users to plug their reading system in at night and automatically download their new content. The expanded set of functionality allows for richer and more interactive models where users can browse for and download their own content.

The protocol was also engineered to facilitate the lending of content, not just its delivery. Libraries and other organizations that require a means to deliver content to users for a limited period of time will find a number of features that facilitate this kind of delivery model. The protocol also enables the use of the PDTB2 content protection scheme where explicit digital rights management issues are a concern.

The protocol has been built on a strong foundation of established technologies to reduce the implementation and maintenance costs for individuals and organizations looking to implement this content delivery model: the interaction between reading systems and services is carried out by SOAP messages over the HTTP protocol; the service operations are all defined by a normative WSDL document; and the protocol itself is compliant with WS-I Basic Profile 1.1.

One feature of the protocol is the discovery of DAISY Online Delivery services. The DAISY Consortium has developed a system and specification for tracking and locating online services.

# 2. Terminology

**This section is normative**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC 2119]](#REF_RFC2119).

In addition, the following terms are used throughout this document with the meanings outlined in this section.

**Bookshelf**

A collection of Content currently assigned and available to a User.

**Borrowable Content**

Content that may be lent to a User, and must be [returned](#TERM_ReturnContent) after being lent. The ownership of the Content does not pass to the User. Borrowable Content includes Content that may be rented for a fee.

**Content**

A resource or resources made available by a Service Provider through a Service, such as DAISY Digital Talking Books. (Singular: Content item.)

**Content Identifier**

The unique identifier assigned to a Content item. This identifier is defined by the Service and is exposed in the [[Dublin Core]](#REF_DublinCoreMetadataElementSetV11) identifier field of the [**contentMetadata**](#TYPE_contentMetadata) type. The identifier must be unique within the scope of the Service and it must not change over time.

**Note:**

The Content Identifier is not required to match any identifiers used in the Content item (for example, the identifier in a DAISY Digital Talking Book's metadata).

**Download**

Transfer of Content from the Service to the Reading System, which the Reading System stores in non-volatile memory.

**Fault**

A [[SOAP 1.1]](#REF_SOAP11) Fault. A Fault carries error and/or status information in a SOAP message. [Section 5.3, “Faults”](#SEC_2_Faults) defines the Faults used in this protocol.

**Interface**

A [[WSDL 1.1]](#REF_WSDL11) port type. A set of Operations supported by the Service.

**Progress State**

The state of a given Download or Streaming activity. Valid state values are: START, PAUSE, RESUME, FINISH. These states can be used to monitor content access activity by the Service Provider.

**Operation**

A [[WSDL 1.1]](#REF_WSDL11) operation. An action supported by the Service.

**Purchasable Content**

Content that may be sold to a User, the ownership of the Content may or may not pass to the User. Purchasable Content includes Content that is offered without charge. It includes any Content that does not require return, such as Content protected by DRM which expires without the need for return.

**Reading System**

A combination of hardware and/or software that accesses a Service and renders Content to the User. A Reading System may be implemented entirely on one device or it may be split among several. Corresponds to a [[WS-I Basic Profile 1.1 Conformance Targets]](#REF_WSIBasicProfile11Compliance) consumer.

**Return Content**

Give up access to a Content item. A Content item is returned when the Reading System has removed any locally-stored data and called the [**returnContent**](#METHOD_ReturnContent)operation to notify the Service to revoke access and remove from the User's bookshelf.

**Restricted Download**

This is a type of Download that looks to protect Content downloaded to Reading Systems. For example a device supports Restricted Downloads if it can ensure the Content is locked to the device. Examples of this support include;

1. Locking downloaded Content using encryption so it may only be consumed on the given device.
2. Stopping the downloaded Content from being copied to external media. For example a Reading System may not support copying media to external devices and therefore can support Restricted Downloads.

**Service**

A web service that implements the DAISY Online Delivery Protocol. Corresponds to a [[WS-I Basic Profile 1.1 Conformance Targets]](#REF_WSIBasicProfile11Compliance) instance.

**Service Delegate**

A file hosting server that is not under the control of the Service Provider.

**Service Provider**

The person(s) or organization(s) who own a Service. The Service Provider may or may not be the same entity who owns the servers the Service runs on.

**Session**

A sequence of Operations between one Reading System and one Service using a unique identifier defined by the Service. A session may persist across several [HTTP](#REF_HyperTextTransferProtocol11) connections. Session identifiers may be reused at the Service's discretion. Session identifiers are sent to the Reading System using [[HTTP Cookies]](#REF_HTTPCookiesInWSIBasicProfile11).

**Streaming**

Transfer of Content from the Service to the Reading System, which the Reading System renders immediately and stores only temporarily.

**Terms Of Service**

The Terms of Service required by some Services, that a User must agree to prior to being authorised to access Service functions. These Terms are supplied as text (and optionally audio) to enable the User to read them prior to stating agreement.

**Type**

An [[XML Schema 2]](#REF_XMLSchemaP2) datatype.

**User**

A person who interacts with a Service using a Reading System and/or or accesses Content from the Service.

# 3. Underlying Technologies

**This section is normative**

## 3.1. HTTP

The DAISY Online Delivery protocol uses [[HTTP 1.1]](#REF_HyperTextTransferProtocol11):

* as the transport layer for all SOAP messages sent and received by a Service; and
* for the transfer of Content data.

Reading Systems must support [[HTTP 1.1]](#REF_HyperTextTransferProtocol11) and secure HTTP (HTTPS) through either [[SSL 3.0]](#REF_SecureSocketsLayer30) or [[TLS 1.0]](#REF_TLS10).

The use of HTTP must conform to [[HTTP 1.1]](#REF_HyperTextTransferProtocol11) and [[RFC 2617]](#REF_RFC2617).

Services and Reading Systems must support HTTP sessions as specified in [[RFC 2109]](#REF_HTTPStateManagement).

**Note:**

An established HTTP session is not in itself a valid indicator that a Reading System has successfully logged on to the Service (refer to [Section 4.3, “User Authentication and Session Management”](#SEC_2_UserAuthenticationSessManage)).

A Service must return the appropriate HTTP status code in the HTTP response (as specified by [[HTTP 1.1]](#REF_HyperTextTransferProtocol11), Section 10) to all HTTP and HTTPS requests sent by a Reading System.

A Service is recommended to return a 302 Moved Temporarily HTTP status code during Service down time if an alternative temporary hosting location can be provided.

### 3.1.1. HTTP Cookies

The DAISY Online Delivery protocol requires the use of [[HTTP Cookies]](#REF_HTTPCookiesInWSIBasicProfile11) (as defined in [[WS-I Basic Profile 1.1]](#REF_WSIBasicProfile11)) to maintain stateful sessions.

A Reading System must be able to receive and send any cookies that are transmitted to it by a Service. As per the [[WS-I Basic Profile 1.1]](#REF_WSIBasicProfile11), a compliant Reading System must not process or manipulate the cookies.

A compliant Service must be able to manage HTTP Cookies.

### 3.1.2. HTTPS

The use of HTTPS for all transactions with a Service is recommended as the data being exchanged may contain confidential information. HTTPS also allows a Reading System to verify the identity of the Service through the use of certificates.

**Security Considerations**

It is recommended when implementing HTTPS that all certificates be registered with a certificate authority and not be self-signed.

All URIs that identify resources served over HTTPS must use the standard URI prefix https:.

A compliant Reading System must support HTTPS. Support for HTTPS is recommended for Services.

### 3.1.3. HTTP Basic Authentication

The HTTP Basic Authentication Scheme described in [[RFC 2617]](#REF_RFC2617) may be used to secure Content against unauthorized access.

When using Basic Authentication, a Service must supply the credentials in the server component field of the URI. The scheme for the userinfo field (as given in [[RFC 2396]](#REF_RFC2396), Section 3.2.2) is: ***userinfo***@***host***:***port***

If the credentials also require a password, then the userinfo field must be of the form: ***userid***:***password***@***host***:***port***

**Security Consideration**

1. [[RFC 2396]](#REF_RFC2396) recommends against the use of the ***userid***:***password*** scheme as it may result in the transmission of passwords in the clear and is known to be a security risk in all cases. A Service should only use this scheme over a secure connection such as HTTPS and Reading Systems should be developed to avoid the known exploits of this method.
2. The current best practice for the storage of passwords is to only store a cryptographic hash of each password in case a database is compromised. A Service, however, may need to retrieve the unencrypted authentication credentials for a User in order to supply them in the userinfo field. Services implementing Basic Authentication using this scheme consequently risk compromising the security of their databases unless secure retrieval methods are implemented.

When retrieving a resource, a Reading System must only send Basic Authentication credentials when they are supplied in the URI returned by a Service.

The credentials required to access Content are not required to be the same as the credentials supplied to the [**logOn**](#METHOD_Logon)operation.

**Note:**

HTTP Basic Authentication credentials must not be used to log on to a Service. For authenticating a SOAP session, refer to [Session Initialization Sequence](#SEC_3_SessionInitialisation).

A compliant Reading System must support Basic Authentication. Service support for Basic Authentication is recommended.

### 3.1.4. HTTP Range Headers

When using HTTP or HTTPS for serving resources, a Service must honor Range Retrieval Requests (as described in section 14.35 of [RFC 2616](#REF_HyperTextTransferProtocol11)).

Services must use correct status codes and Content-Range and Content-Length headers when serving partial content (as described in section 14.16 of [RFC 2616](#REF_HyperTextTransferProtocol11)).

As it is not possible to require support for range headers on Service Delegates, Reading Systems must be able to handle servers that do not support range headers.

## 3.2. WS-I

### 3.2.1. Basic Profile 1.1

The DAISY Online Delivery protocol is compliant with the requirements of [[WS-I Basic Profile 1.1]](#REF_WSIBasicProfile11). All conformant implementations of this protocol must also be compliant with [[WS-I Basic Profile 1.1]](#REF_WSIBasicProfile11).

### 3.2.2. WSDL Binding Style

The WSDL binding style used in the abstract WSDL document in [Appendix A, *WSDL Abstract Definition*](#SEC_AppendixA) is wrapped document-literal. The wrapped document-literal style is a subset of the document-literal style and satisfies normative requirement R2712 of [[WS-I Basic Profile 1.1]](#REF_WSIBasicProfile11).

Conformant Services must use the wrapped document-literal binding style.

# 4. Protocol Fundamentals

**This section is normative**

## 4.1. Service Models

The DAISY Online Delivery protocol supports two basic service models:

* a ***lending*** model, where the Service offers [Borrowable Content;](#TERM_BorrowableContent) and
* an ***acquisition*** model, where the Service offers [Purchasable Content](#TERM_PurchasableContent).

A Service may offer [Borrowable Content](#TERM_BorrowableContent), [Purchasable Content](#TERM_PurchasableContent) or both.

To provide identical Content under both service models, a Service must supply two Content items with different Content Identifiers. The Content items may have the same set of resources.

### 4.1.1. Lending Model

#### 4.1.1.1. Service Requirements

The following conditions apply to any item of Borrowable Content:

* the Content item must be listed in the User's bookshelf [**contentList**](#TYPE_ContentList) until it is [returned](#TERM_ReturnContent); and
* the Service must allow the Reading System to call [**returnContent**](#METHOD_ReturnContent) at any time during any Session to [return](#TERM_ReturnContent) the Content item.

#### 4.1.1.2. Reading System Requirements

The Reading System must not call [**returnContent**](#METHOD_ReturnContent)with a Content Identifier of a Content item unless all local copies of that Content item have been removed.

#### 4.1.1.3. Content Expiry

This protocol defines the use of the returnBy attribute of the [**contentMetadata**](#TYPE_contentMetadata) type to assist in the automatic return of Content by a [Reading System](#TERM_ReadingSystem). This protocol does not require the enforcement of these methods on the Reading System. [Service Providers](#TERM_ServiceProvider) should investigate other methods for protecting Content that must expire at a specific time (for example DRM schemes like [PDTB2]).

The returnBy attribute indicates the time before which the User should [return](#TERM_ReturnContent) the Content item. Reading systems are required to keep a reference clock which should be synced prior to connecting to the DODP service. The clock would be kept in UTC format and the User cannot modify the internal clock.  
The communication between the [Service](#TERM_Service) and the [Reading System](#TERM_ReadingSystem) will be done in UTC.

The Reading System will delete the [Content](#TERM_Content) based on the returnBy attribute provided for that Content.

Reading Systems should communicate the due date provided in the returnBy attribute to the User.

Users should be notified that a Content item has expired and will be deleted.

### 4.1.2. Acquisition Model

#### 4.1.2.1. Service Requirements

The following conditions apply to any item of [Purchasable Content](#TERM_PurchasableContent):

* the Content item may be listed in the User's bookshelf [**contentList**](#TYPE_ContentList). This specification does not specify the lifetime of Purchasable Content's availability in the bookshelf [**contentList**](#TYPE_ContentList).

## 4.2. Automatic Device Configuration

Automatic Device Configuration is supported to allow Service Providers and Reading System manufacturers to develop and deploy Reading Systems that at the time of release are not configured to a specific Service or User.

Automatic Device Configuration relies on the use of the DODP Discovery file which includes the types: [**serviceList**](#TYPE_ServiceList) and [**readingSystemList**](#TYPE_readingSystemList).

Support for Automatic Device Configuration is broken down in two stages;

1. Service Discovery  
    - Make available a list of DODP compliant Services.
2. Reading System Configuration  
    - Provide access to User credentials data

### 4.2.1. Service Discovery

When a [Reading System](#TERM_ReadingSystem) connects to the internet and is not configured to connect to a [Service Provider](#TERM_ServiceProvider), it may request a list of available compliant Services from the Daisy Consortium website. This list (the DODP Discovery file) may then be used to present the User with a list of available Service Providers as defined in the [**serviceList**](#TYPE_ServiceList). The Services may then be ordered logically using the Reading System’s current geolocation (if available) and the Reading System’s language.

When a Reading System is configured with a Service Provider URL this option should be available to the user through the UI.

#### Accessing the Service Discovery file

Service Discovery must not be supported by a [Service Provider](#TERM_ServiceProvider) as the list is maintained by the Daisy Consortium and accessing this list is the responsibility of a [Reading System](#TERM_ReadingSystem).

This file can be accessed without the need to Authenticate – i.e. it is publically available.

The DODP Discovery file is accessed using http from the following location.  
 **<INSERT DODP DISCOVERY FILE URL HERE>**

#### Sample Service List

<serviceList>   
 <!-- Vision Australia -->

<service>

<name>Vision Australia</name>

<url>https://something.visionaustralia.org/service.svc</url>

<website>http://www.visionaustralia.org/</website>

<phone>611300654656</phone>

<country>au</country>

<languages>

<language>en</language>

</languages>

<latitude>-37.8471942</latitude>

<longitude>145.0082843,13</longitude>

</service>   
</serviceList>

#### Managing changes to the DODP Discovery File

The DODP Discovery file will be centrally hosted and maintained by the Daisy Consortium. A Service Provider can apply to the Consortium to be added to the list, once the URL and details are confirmed and the Service is verified by the Consortium, the list will be updated.

### 4.2.2. Reading System Configuration

#### Once a [Reading System](#TERM_ReadingSystem) has been configured with a valid Service URL a method is required to implement Reading System setup without manual steps. This has previously been a significant factor slowing down delivery and adoption of the online Service. To avoid the hardware players requiring manual configuration by technical staff, a standard-based, interoperable (manufacturer-independent) way of registering a Reading System to a Service has been defined that allows a Reading System to obtain the required user credentials.

Reading Systems may be delivered pre-configured to connect a specific Service or obtain a new service URL using the Service discovery defined above.

When a Service URL is present but no credentials are available the Reading System will try to obtain the user credentials for the Service by invoking the [**getUserCredentials**](#METHOD_getUserCredentials) operation.

The [**getUserCredentials**](#METHOD_getUserCredentials) operation retrieves the user credentials based on the [**ReadingSystemAttributes**](#TYPE_ReadingSystemAttributes) for the Reading System, which must contain a serial number.

A Reading System may call this operation before the Session Initialization Sequence when the user credentials are not known.

The Service Providers will maintain a database of Reading System serial numbers that are known to belong to a member. If the serial number passed by [**getUserCredentials**](#METHOD_getUserCredentials) is found on the database and marked as active, it will then issue the response to the Reading System containing the user credentials and mark that entry as inactive.

The Service Provider will retrieve the encryption information for passing the information to the Reading System by comparing the Reading System's manufacturer and optionally model with the list hosted by the Consortium.

The public key listed for that manufacturer will be used to encrypt the user credentials passed on to the Reading System. The text content is encoded using base64 before being passed on to the Reading System.

#### The DODP Discovery file, along with a list of compliant Services also contains details of approved Reading Systems ([readingSystemList](#TYPE_readingSystemList)) and their public keys that are used to encrypt user credentials when transmitting to the device.

#### Sample Reading System List

<readingSystemList>  
 <readingSystem>  
 <manufacturer>Shinano Kenshi Co.,Ltd.</manufacturer>  
 <model>PTX1Pro</model>  
 <publicKey>http://daisy.plextalk.com/key</publicKey>  
 </readingSystem>  
</readingSystemList>

## 4.3. User Authentication and Session Management

Before a [Reading System](#TERM_ReadingSystem) can interact with a [Service](#TERM_Service) to obtain [Content](#TERM_Content), it must successfully authenticate itself and establish a valid [Session](#TERM_Session). The following subsections outline the steps in this process.

### 4.3.1. Session Initialization

The following steps must be followed when starting a [Session](#TERM_Session) to authenticate a [Reading System](#TERM_ReadingSystem) to a [Service](#TERM_Service):

The [Service Provider](#TERM_ServiceProvider) is responsible for stipulating and supplying the User with the credentials required to authenticate a Reading System. A Service may provide credentials per User, per group or class of User, per Reading System or by any other method.

1. The Reading System must pass the User's login credentials and information about the Reading System's capabilities to the Service by calling the [**logOn**](#METHOD_Logon) operation.
2. The Service must verify the provided parameters and, if valid, issue a cookie with a unique identifier for the Session. The Service must send the cookie to the Reading System when returning a successful response to the [**logOn**](#METHOD_Logon) operation.

Upon a successful [**logOn**](#METHOD_Logon) operation, the Reading System is provided all necessary information about the Service in the response to the [**logOn**](#METHOD_Logon) call.

If a Service returns a Fault to the [**logOn**](#METHOD_Logon) operation, or if a required return value is not provided, a Reading System may attempt to re-initialize the Session or abort the logon process. A Reading System may alert the user, attempt to reconnect automatically or take any action, particular to that device.

After completing a successful logon, a Reading System may call any Operations defined by this specification.

**Note:**

A Service may issue a cookie even if [**logOn**](#METHOD_Logon) fails.

### 4.3.2. Session Duration

A Session begins after a successful [**logOn**](#METHOD_Logon)operation. The Session must remain active until the Reading System successfully calls [**logOff**](#METHOD_LogOff)or the Service terminates it. This protocol does not define behaviours relating to the termination of Sessions. Time out intervals, reasons for forced termination and related aspects are defined by the implementation.

A Service should persist a Session across multiple HTTP connections by a Reading System as long as the Session is still active. A Service may allow multiple concurrent connections with the same session ID.

### 4.3.3 Guest Account Access

Service Providers may allow guests to use their Services and e.g. listen to sample books or browse titles via Dynamic Menus. The username and password for guest accounts must be fixed to guest so that Reading Systems by default can try to access Services with the guest account.

## 4.4. Issuing and Transfer of Content

The steps for a Reading System to request Content resources and to Download or begin Streaming the Content are outlined in the following sections.

### 4.4.1. Content Retrieval Sequence

In order to [Download](#TERM_Download) or [Stream](#TERM_Streaming) a Content item from a Service, a Reading System must perform the following;

All of the Operations identified in this section take a [Content Identifier](#TERM_ContentIdentifier) as a parameter which is generally sourced from the [**contentList**](#_6.4._The_contentList).

1. [**getContentResources**](#METHOD_GetContentResources)must be called to obtain the URIs of all the resources that constitute the Content item. A Service may allow more than one call to **getContentResources** for each Content item.   
     
   The call to **getContentResources** includes a ***methodHint*** which informs the Service if the content access will be either a Download or Streaming activity.

A Service should allow calls to **getContentResources** for the same Content item over more than one Session.

### 4.4.2. Monitor Download/Streaming Activity

The DAISY Online Delivery protocol offers the operation [**setProgressState**](#_5.1.7._The_setProgressState) to assist a Service Provider in monitoring activity around Content access. This is done by setting the [Progress State](#TERM_ProgressState) which allows the Service to track the state of a given Download or Streaming activity.

Valid states are: START, PAUSE, RESUME and FINISH

By interpreting these states a Service can track such metrics as the number of concurrent download/streaming activities which may be useful in managing Service quality.

When a Reading System wishes to access Content it will call [**getContentResources**](#_5.1.4._The_getContentResources) to obtain the set of relevant URL’s and also supplies a ***methodHint*** which informs the Service that the activity will either be of type download or streaming.

Prior to accessing any of the relevant Content URL’s, the Reading System uses the **setProgressState**(contentID, “START”) operation to inform the Service that access is about to begin.

If the Reading System wishes to pause the activity, then **setProgressState**(contentID, ”PAUSE”) is executed, calling **setProgressState**(contentID, ”RESUME”) once the operation restarts.

When the activity is complete, the Reading System calls **setProgressState**(contentID, “FINISH”).

This enables the Service to know what activity is currently occurring by User, by Content item.

### 4.4.3. Downloading and Streaming of Content

Once the Reading System has retrieved the list of **resources** for a Content item, and the [progressState](#TERM_ProgressState) has been set to START, the Reading System may begin downloading or streaming the resources using the URIs supplied in the **resource** elements.

The **resource** type has both a uri attribute and a localURI attribute. localURI is a local name for the Reading System to use to reference the resource, while uri is the location of the resource's data. This system lets a Service provide resources with arbitrary URIs (such as those served by a script), while allowing Reading Systems to follow internal links in a Content item, such as in a DAISY DTB. The localURI path is relative to the root path of the Content item.

A Reading System should not use the uri attribute to name resources locally, as the URIs may resolve to scripts or other content delivery mechanisms.

Reading Systems may use the [[MIME]](#REF_MIMEPart2MediaTypes) type information in the mimeType attribute of a **resource** to order the transfer of resources. For example, a Streaming Reading System may retrieve the OPF, NCX and SMIL files of a DAISY Digital Talking Book to provide the User full navigation before downloading any audio data.

Resources may be stored on servers belonging to a Service Delegate. A Service must provide the Reading System any credentials required to access content stored on a Service Delegate's servers. The URI of each resource secured with Basic Authentication must include the credentials required to access that resource. Refer to [Section 3.1.3, “HTTP Basic Authentication”](#SEC_3_HTTPBasicAuthentication).

When a Reading System attempts to stream DAISY content, it must ensure files are downloaded in a logical order to prevent excessive calls and load on Services for downloading non required files. I.e. the Reading System will access the NCC or NCX files and by interrogating their contents determine the files that are needed to begin streaming. This ensures the downloading of the entire item is not required to begin streaming.

A Reading System may wish to perform unattended / background downloads and may do this by setting the performsAutomaticDownload attribute in the [**readingSystemAttributes**](#TYPE_ReadingSystemAttributes) and then checking the availableForAutomaticDownload attribute returned as part of the [**contentMetadata**](#TYPE_contentMetadata) is set to true.

### 4.4.4. Publishing Updates and Instalments

This section explains how Service Providers can publish updates to Content items using this protocol.

The [**resources**](#TYPE_Resources) type and each [**contentItem**](#ELE_contentItem) in a [**contentList**](#TYPE_ContentList) have an optional lastModifiedDate attribute that indicates the last time the Content item was modified. A Reading System can use this information to determine if the Content item on the Service has been updated since the last time it was accessed. Each [**resource**](#ELE_resource) in the **resources** list also has an optional lastModifiedDate attribute that the Reading System may use to determine which specific resources have been updated.

The functionality detailed in this section can also be used to publish Content in instalments by progressively updating the same Content item as new sections of the Content item are authored.

### 4.4.5. Content Synchronization sequence

**This section is informative**

A Reading System can automatically synchronize the Content it stores locally with the Content available to the User on the Service. The following sequence of steps can be taken to synchronize the Content. A Session must be initialized, but other Operations may be called before synchronization.

1. If the User has chosen to return any Content while the Reading System was offline, the Reading System calls [**returnContent**](#_5.1.6._The_returnContent)**(**itemid**)** for each Content item.
2. The Reading System calls [**getContentList**](#_5.1.5._The_getContentList)**(**"bookshelf", 0, -1**)**.
3. The Reading System returns each Content item that has past its returnBy date by calling [**returnContent**](#_5.1.6._The_returnContent)**(**itemid**)**.
4. For each Content item in the list, the Reading System calls [**getContentResources**](#_5.1.4._The_getContentResources)**(**itemid**)**, as described in [Section 4.4.1, “Content Retrieval Sequence”](#_4.4.1._Content_Retrieval).

At this point, the Reading System will have the [**contentMetadata**](#TYPE_contentMetadata) and [**resources**](#TYPE_Resources) for every Content item available to the User. It can begin downloading (see [4.4.2 Monitor Download/Streaming Activity](#_4.4.2._Monitor_Download/Streaming) and [4.4.3 Downloading and Streaming of Content](#_4.4.2._Downloading_and)) new and updated Content, or it can offer the titles to the User for streaming, or it can continue calling Operations.

Since a Service is free to return a partial [**contentList**](#TYPE_ContentList), the [**getContentList**](#METHOD_GetContentList) operation may need to be called several times with the appropriate index parameters to retrieve the full lists.

**Note:**

When synchronizing the Content, Reading Systems should be aware that Content may appear new to a Reading System may have been accessed either automatically by a Service or by another Reading System which was setup with the same User credentials.

#### 4.4.5.1 Best practise for Services returning content lists

Services are allowed to return a [**contentList**](#TYPE_ContentList) with another range than exactly what is being requested by the Reading System in [**getContentlist**](#METHOD_GetContentList) requests according to the following two scenarios:

1. The Reading System does not specify any ***firstItem*** / ***lastItem*** range in the [**getContentlist**](#_5.1.5._The_getContentList) request.  
     
   In this case the Service should try to return the complete list if possible, but may return it in multiple chunks if needed for performance reasons.
2. The Reading System specifies a ***firstItem*** / ***lastItem*** range in the [**getContentlist**](#_5.1.5._The_getContentList) request.  
     
   In this case the Service should try to return exactly this range. The Service may return a smaller range (for example if there is not enough items to fill the list or for performance reasons). However, the Service may not return a larger range than what is being requested by the Reading System.

### 4.4.6. Rights management

The [[PDTB2]](#REF_DAISYPDTB2) format may be used to protect Content. This protocol provides a key exchange mechanism, the [**getKeyExchangeObject**](#_5.2.15._The_getKeyExchangeObject) operation, to allow Reading Systems to request keys from Services to access encrypted Content.

Reading Systems and Services are not required to support PDTB2. Services may provide PDTB2-protected Content without supporting **getKeyExchangeObject** when alternate means of key provision have been implemented, for example when keys are provided with the Reading System.

**Note:**

This protocol does not provide any trust mechanism; there is no method for Reading Systems to provide their public keys to a Service using this protocol. Services supporting PDTB2 must use some out-of-band method to register keys from Reading System manufacturers.

There is no mechanism for expiring keys in this protocol.

#### 4.4.6.1. Declaring PDTB2 Support

If a Reading System supports PDTB2, it should inform the Service by including a [**supportedContentProtectionFormats**](#ELE_SupportedContentProtectFormats) element with the value PDTB2, and a [**keyRing**](#TYPE_KeyRing) element listing the names of the keys in its key ring, in its [**readingSystemAttributes**](#TYPE_ReadingSystemAttributes). The key names provided may be some or all of the public keys the Reading System supports.

To indicate that a Service supports PDTB2 key exchange, the Service must include an [**operation**](#TERM_Operation)element with the value PDTB2\_KEY\_PROVISION in its [**serviceAttributes**](#TYPE_ServiceAttributes).

#### 4.4.6.2. Identifying PDTB2 Content

If a Content item is protected using PDTB2, a Service must include a **meta** element in its [**contentMetadata**](#TYPE_contentMetadata) named pdtb2:specVersion with the value 2005-1.

In addition, the mimeTypes of protected resources in the [**resources**](#TYPE_Resources) list must be as defined in section 4.1.1, "Package file", of the [[PDTB2]](#REF_DAISYPDTB2) specification. Those MIME types begin with application/x-pdtb….

#### 4.4.6.3. Accessing PDTB2 Content

Any Reading System may access Content items marked as PDTB2-protected. Reading Systems that do not support PDTB2 will not be able to render some or all of the resources.

A PDTB2-protected Content item must have an Authorization Object (AO) in its resources. The Reading System can inspect the AO for the name of the key that secures the key required to decrypt the Content item. If the Reading System does not have the key to access an encrypted section of an AO, it may request a Key Exchange Object (KXO) from the Service.

To obtain a KXO, a Reading System must call the [**getKeyExchangeObject**](#METHOD_GetKeyExchangeObject)operation with the name of the requested key.

The Service may choose any of the keys supplied in the [**readingSystemAttributes**](#TYPE_ReadingSystemAttributes) to encrypt the KXO. If the Service does not have any of the keys or if the User is not authorized to access the Content item, then the Service must reply with an [**invalidParameter**](#FAULT_InvalidParameter)Fault.

If the Reading System receives a valid KXO from the Service, the Reading System can then use that KXO to access the key in the AO that unlocks the protected Content item.

## 4.5. Service Announcements

The DAISY Online Delivery protocol allows Service Providers to deliver service announcements to a User's Reading System. A service announcement is a short message in text and/or audio format that conveys information, such as an alert about expected Service down time or a warning about overdue Content items, to the User.

To indicate that a Service supports service announcements, the Service must include an [operation](#TERM_Operation) element with the value SERVICE\_ANNOUNCEMENTS in its [**serviceAttributes**](#TYPE_ServiceAttributes).

Services are not required to support service announcements. Reading Systems should be able to retrieve and render text and audio service announcements for maximum interoperability.

Services that do support service announcements are recommended to provide service announcements in advance regarding planned system work that affects the availability of the Service.

### 4.5.1. New Announcements

A Reading System may check for new messages at any time when connected to a Service by calling the [**getServiceAnnouncements**](#METHOD_GetServiceAnnouncements)operation. It is recommended that Reading Systems check for announcements immediately after completing the initialization of a new Session.

The Service can set the importance level for each announcement from a level of 1 (most important) to 3 (least important) and specify the type of announcement as one of ERROR, SYSTEM, WARNING or INFORMATION to assist Reading Systems in ordering the announcements for rendering to the User.

A Service may remove unread announcements from the Service at any time and for any reason. To avoid potential retrieval conflicts, a Reading System must treat the [**announcement**](#ELE_annoucement) IDs as valid for no longer than the duration of the active Session.

If a Service does not support service announcements, the Service must return an [**operationNotSupported**](#FAULT_OperationNotSupported) Fault when a Reading System calls [**getServiceAnnouncements**](#METHOD_GetServiceAnnouncements).

### 4.5.2. Read Announcements

After rendering announcements to a User, a Reading System may call the [**markAnnouncementsAsRead**](#METHOD_MarkAnnouncementsAsRead)operation to inform the Service not to send the announcement again the next time the User connects to the Service.

To prevent conflicts arising from announcements that have been removed from the Service, a Reading System must only pass identifier values obtained from the last call to [**getServiceAnnouncements**](#_5.2.1._The_getServiceAnnouncements) during the active Session to [**markAnnouncementsAsRead**](#_5.2.2._The_markAnnouncementsAsRead).

If a Reading System calls [**markAnnouncementsAsRead**](#_5.2.2._The_markAnnouncementsAsRead), and a Service returns false, then the announcement has already been marked as read. If a Service returns an [**invalidParameter**](#FAULT_InvalidParameter) Fault, then the announcement identifier does not exist on the Service.

A Reading System may mark more than one announcement as read in the same call to [**markAnnouncementsAsRead**](#METHOD_MarkAnnouncementsAsRead). If an [**invalidParameter**](#FAULT_InvalidParameter) Fault is returned, the Reading System must call [**markAnnouncementsAsRead**](#METHOD_MarkAnnouncementsAsRead) sequentially for each announcement to determine which identifier caused the Fault.

### 4.5.3 Announcement Priorities

Each announcement has an associated priority. The following recommendations are made to assist the Reading System in interpreting the given priority.

Announcements of type WARNING, ERROR, INFORMATION:

* **Priority 1, 2 or 3:** Next time the User is in STOP mode, render the announcement to the user.

Announcements of type SYSTEM:

* **Priority 1:** Immediately abort all current activities, render the announcement to the User.
* **Priority 2:** Wait until the current activity (e.g. streaming a file) is finished and render the announcement to the User.
* **Priority 3:** Next time the Reading System is in STOP mode, render the announcement to the User.

## 4.6. Bookmarks

* The DAISY Online Delivery protocol uses the Portable Bookmarks and Highlights grammar from [[Z39-86.2005]](#REF_Z3986_2002_SpecForDTB) to record Users' bookmarks with the [**setBookmarks**](#METHOD_SetBookmarks) operation. This operation can also be used by Reading Systems to record the last reading position for a Content item. Reading Systems can retrieve stored bookmarks with the [**getBookmarks**](#METHOD_GetBookmarks) operation. Services can also predefine bookmarks for the User to access.

**Note:**

* [[Z39-86.2005-BOOKMARKS]](#REF_PortableBookmarks) constitutes the normative reference regarding the use and semantics of this type. However, audio notes are ***not supported*** in the [**setBookmarks**](#METHOD_SetBookmarks) and [**getBookmarks**](#METHOD_GetBookmarks) operations in this version of the protocol.
* To indicate that a Service supports the retrieval of bookmarks, the Service must include an [**operation**](#TERM_Operation)element with the value GET\_BOOKMARKS in its [**serviceAttributes**](#TYPE_ServiceAttributes).
* To indicate that a Service supports the setting of bookmarks, the Service must include an [**operation**](#TERM_Operation)element with the value SET\_BOOKMARKS in its [**serviceAttributes**](#TYPE_ServiceAttributes).
* If a Service supports both the setting and retrieval of bookmarks, a Reading System may use the lastMark element of the [**bookmarkSet**](#TYPE_BookmarkSet) to store the User's last reading position. The Reading System should check for a last reading position before resuming playback.
* A Service may support the retrieval of bookmarks or both the setting and retrieval of bookmarks. A Reading System should support both operations for maximum interoperability.
* The lastmark position can be obtained through the [**getContentList**](#METHOD_GetContentList) response or by invoking the [**getLastmark**](#METHOD_GetLastMark) operation. It is a recommendation that Reading Systems don't invoke the **getLastmark** operation when building a bookshelf and instead rely on the information received from the **getContentList** operation.

## 4.7. Dynamic Menus

**This section is informative**

The DAISY Online Delivery protocol offers the ability for Services to provide dynamic menus to compliant Reading Systems. Users can use these menus to perform a wide variety of activities that may be offered by the Service, such as browsing the Service's catalog, answering surveys, or purchasing items from an online store.

These sections describe the basic principles of dynamic menu systems. Refer to [[Dynamic Menus Primer]](#REF_DynamicMenusPrimer) for informative usage examples.

### 4.7.1. Support

**This section is normative**

To support dynamic menus, a Reading System or Service must implement the [**getQuestions**](#METHOD_GetQuestions) operation.

To indicate that a Service supports dynamic menus, the Service must include an [**operation**](#TERM_Operation)element with the value DYNAMIC\_MENUS in its [**serviceAttributes**](#TYPE_ServiceAttributes).

A Reading System that supports dynamic menus must declare which [input types](#_supportedInputTypes) it supports in its [**readingSystemAttributes**](#TYPE_ReadingSystemAttributes). A Service should not send any question which requires an input type not supported by the Reading System. If the Reading System declares no input types, then the Service should only send [**multipleChoiceQuestion**](#ELE_multipleChoiceQuestion)s.

### 4.7.2. Root Question

**This section is normative**

Every dynamic menu system must have a root question. The root question is the base starting menu, or main menu. It has an id of default.

The first call to [**getQuestions**](#METHOD_GetQuestions) in a Session must be with a single [**userResponse**](#ELE_userResponse) whose questionID is default, to retrieve the root question.

### 4.7.3. Navigation

**This section is normative**

A question is the basic unit of navigation in the dynamic menu system, as each set of menu options can be conceptually viewed as querying a User about the next step to take.

[**getQuestions**](#METHOD_GetQuestions) takes one parameter: [userResponses](#TYPE_UserResponses). The **userResponses** type either contains a response to a previous question(s) or has a questionID set to one of the three reserved keywords defined in [Section 4.7.6, “Reserved IDs”](#_4.7.6._Reserved_IDs).

A User navigates a menu system by repeatedly selecting answers to the questions returned from calls to **getQuestions** until one of the end points outlined in [Section 4.7.5, “End Points”](#_4.7.5._End_Points), is reached.

A Service may send more than one question in response to any call to **getQuestions**. A Reading System should collect the responses to each question before calling **getQuestions** again and each response must be contained in a separate [**userResponse**](#_userResponse) element.

### 4.7.4. Question Types

**This section is normative**

The DAISY Online Delivery protocol defines two types of questions for navigating a menu system:

**Multiple Choice Questions**

Multiple choice questions are a set of options to pick from. A multiple choice question is represented by the [multipleChoiceQuestion](#_multipleChoiceQuestion) child element of the [**questions**](#TYPE_Questions)type.

**Input Questions**

Input questions allow the User to respond with text and/or audio input. An input question is represented by the [**inputQuestion**](#_inputQuestion)child element of the [**questions**](#TYPE_Questions)type.

A Service must specify if an input question requires a numeric, alphanumeric or audio-based response in the [**inputTypes**](#_inputTypes) child element of the [**inputQuestion**](#_inputQuestion) type. Multiple input types means that any one of the types specified may be used.

### 4.7.5. End Points

**This section is normative**

A [questions](#TYPE_Questions) element, received through a call of [**getQuestions**](#METHOD_GetQuestions), containing one of the following as its child indicates an end point of the menu sequence:

* a [**label**](#_label_1), which may provide an informative or concluding statement for the User, such as confirmation of a purchase or thanks for completing a survey; or
* a [**contentListRef**](#_contentListRef) containing the ID of a [**contentList**](#TYPE_ContentList), when the menu sequence has resulted in the generation of a list of Content items that the User may then access.

### 4.7.6. Reserved IDs

**This section is normative**

There are three reserved question identifier values:

**default**

Indicates that the Reading System is requesting the root question. Refer to [Section 4.7.2, “Root Question”](#_4.7.2._Root_Question).

**search**

Indicates that the Reading System is requesting the search menu.

A Service must explicitly declare whether or not it supports this value with the [**supportsSearch**](#_supportsSearch) element of its [**serviceAttributes**](#_6.14._The_serviceAttributes).

**back**

Indicates that the Reading System has requested to step back one menu in the sequence.

A Service must explicitly declare whether or not it supports this value with the [**supportsServerSideBack**](#_supportsServerSideBack) element of its [**serviceAttributes**](#_6.14._The_serviceAttributes).

A Service must return an [**invalidParameter**](#FAULT_InvalidParameter) Fault if a Reading System calls the [**getQuestions**](#_5.2.13._The_getQuestions) operation with the back value when no prior call has been made to this operation in the active session.

Reading Systems that support dynamic menus must support the default value; search and back are optional.

A Service must return an [**invalidParameter**](#FAULT_InvalidParameter) Fault if a Reading System calls the [**getQuestions**](#_5.2.13._The_getQuestions) operation with the search or back values when these values are not supported by the Service.

## 4.8. Managing Terms of Service

**This section is informative**

The DAISY Online Delivery protocol offers the ability for a Service to require agreement to [Terms of Service](#TERM_TermsOfService) prior to providing access. The Reading System will receive a [**TermsOfServiceNotAccepted**](#FAULT_TermsOfServiceNotAccepted) Fault if Terms of Service agreement is required and agreement has not been previously accepted by the User.

Note that the Service may issue updated Terms of Service and may therefore Fault with [**TermsOfSericeNotAccepted**](#FAULT_TermsOfServiceNotAccepted) to re-gain agreement to the updated terms even though the User may have agreed to a previous set of Terms.

A Service that does not require acceptance to Terms of Service does not need to implement the [**getTermsOfService**](#_5.1.8._The_getTermsOfService) or [**acceptTermsOfService**](#_5.1.9._The_acceptTermsOfService) operation.

### 4.8.1 Retrieving Terms of Service content

The operation [**getTermsOfService**](#_5.2._Optional_Operations) is used to retrieve the Terms of Service text (and optional audio). The Reading System renders the Terms to the User and requests the User to accept them prior to accessing any Service functions including accessing the User’s bookshelf or downloading/streaming Content.

Terms of Service are not required to provide guest access if guest access is supported.

### 4.8.2 Accepting Agreement to Terms of Service

If the User accepts the Terms of Service the Reading System will call the [**acceptTermsOfService**](#_5.1.9._The_acceptTermsOfService) operation to notify the Service that the Terms have been accepted. The Service records the fact the Terms of Service have been accepted by the User to ensure this Fault is not generated in future Sessions.

# 5. API Reference

**This section is normative**

## 5.1. Required Operations

This section documents the protocol operations that all Services must support.

### 5.1.1. The logOn Operation

Logs a Reading System on to a Service.

**Request parameters**

**username**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The account name used to access the Service.

**password**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The account's password.

**readingSystemAttributes**

Type: [**readingSystemAttributes**](#TYPE_ReadingSystemAttributes)

Contains the Reading System attributes.

**Response**

Type: [**serviceAttributes**](#TYPE_ServiceAttributes)

Contains the attributes of the Service.

**logOn** must either return [**serviceAttributes**](#TYPE_ServiceAttributes) or a Fault.

If the request parameters are not valid for logon, the [**unauthorized**](#FAULT_Unauthorised) Fault should be returned.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [operationFailed](#FAULT_OperationFailed), [unauthorized](#FAULT_Unauthorised)

### 5.1.2. The logOff Operation

Logs a Reading System off a Service.

**Request parameters**

**logOff** takes no parameters.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the **logOff** was successful.

**logOff** must either return true or a Fault; it must not return false.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [operationFailed](#FAULT_OperationFailed),

### 5.1.3. The addContentToBookshelf Operation

Requests a Service to add a specified Content item to the user’s bookshelf.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item being requested.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Content item was added successfully.

This operation can only return true or a Fault. It cannot return false.

If the content item cannot be added to the User’s bookshelf then the [**OperationFailed**](#FAULT_OperationFailed) Fault should be used to allow a label to be passed back containing details of the reason – for example, the daily loan limit was exceeded.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [noActiveSession](#FAULT_NoActiveSession), [operationFailed](#FAULT_OperationFailed), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.1.4. The getContentResources Operation

Retrieves the [resources](#TYPE_Resources) list for the specified Content item.

The Service will set and maintain the firstAccessedDate and lastAccessedDate for this contentItem based on this event which is made available in subsequent calls to [getContentList](#_5.1.5._The_getContentList).

The **getContentResources** Operation must be called prior to either a Streaming or Download event beginning.

If the intention of what to do with the content changes (for example ***methodHint*** changes from download to stream), the **getContentResources** must be re-called to ensure the Service is aware of what the content is being accessed for.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

Contains the Content Identifier of the Content item for which the **resources** list is being requested.

**methodHint**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

Contains the value download or streaming.

This parameter constitutes a hint to the Service regarding which resources to return in order to optimise the retrieval process.

**priorityHint**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

Contains the value low, normal or high.  
  
This parameter constitutes a hint to the Service regarding which priority the Reading System has for retrieving these resources.

**Response**

Type: [**resources**](#_6.13._The_resources)

Contains the resources list for the specified Content item.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.1.5. The getContentList Operation

Retrieves a list of Content items.

The list returned by the Service can be pre-composed, in which case it is retrieved by passing the bookshelf reserved value defined in the ***id*** parameter below. This would return all content items valid for the given device. (Refer to [4, *Protocol Fundamentals*](#_4._Protocol_Fundamentals) for information on the contexts in which these reserved values are used.)  
  
An example where Content items are not returned to the Reading System is where the Reading System has declared in its [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes) that it does not support restricted downloads, yet requested a bookshelf that contains such items.

The list can also be dynamic (e.g., the result of a dynamic menu search operation sequence). In this case, the ***id*** value used to refer to the list is provided in the return value of a previous call to [**getQuestions**](#_5.2.13._The_getQuestions). (Refer to the [**questions**](#_6.9._The_questions) type for more information.)

**Request parameters**

**id**

Type: [xs:NMTOKEN](http://www.w3.org/TR/xmlschema-2/#NMTOKEN) [[XML Schema 2]](#REF_XMLSchemaP2)

The identifier for the content list to retrieve.

The following value is reserved and must not be used as an identifier except as defined below.

**bookshelf**

Refers to a list of Content items available to a User.

The list must include all Borrowable Content items regardless of whether they have been downloaded or not. The list may include Purchasable Content items. The list excludes Content items that have [expired](#_4.1.1.3._Content_Expiry).

Services that provide Borrowable Content must recognize this identifier.

**firstItem**

Type: [xs:int](http://www.w3.org/TR/xmlschema-2/#int) [[XML Schema 2]](#REF_XMLSchemaP2)

When retrieving a subset of a **contentList**, contains the index of the first item in the subset to retrieve. The first item in the list has the index 0.

**lastItem**

Type: [xs:int](http://www.w3.org/TR/xmlschema-2/#int) [[XML Schema 2]](#REF_XMLSchemaP2)

When retrieving a subset of a **contentList**, contains the index of the last item in the subset to retrieve. The value -1 indicates a request to retrieve all items from ***firstItem*** to the end of the list.

**sortOrder**

Type: [xs:](http://www.w3.org/TR/xmlschema-2/#int)string [[XML Schema 2]](#REF_XMLSchemaP2)

The preferred sort order of the returned content list.  
  
Allowed values are:  
SORT\_FIRSTACCESSED, SORT\_TITLE, SORT\_CATEGORY, SORT\_AUTHOR.  
  
If this parameter is empty the Service may return the **contentList** in any order or default to SORT\_FIRSTACCESSED.

**Response**

Type: [**contentList**](#_6.4._The_contentList)

Contains the requested Content list (or a segment of the list).

The value of the id attribute of the returned **contentList** must match the value of the ***id*** parameter passed to the [[**get**](file:///C:\Temp\do-spec-20100402\do-spec-20100402.html#op_getContentList)**ContentList**](#_5.1.5._The_getContentList) operation.

If the value of the ***firstItem*** and/or ***lastItem*** parameters is invalid, a service must return an empty **contentList** with the value of its ***totalItems*** attribute set to the total number of items in the entire **contentList**.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.1.6. The returnContent Operation

Notifies the Service that the specified Content item has been deleted from the Reading System.

The specified Content item is removed from a User’s Bookshelf after a successful call to this operation.

A Reading System must delete the Content item before calling **returnContent**. A Reading System must not call **returnContent** for a Content item that is not on the users Bookshelf.

**Note:**

This protocol cannot guarantee that a Reading System has actually deleted the Content item before calling **returnContent**. The Service receiving a call to this operation does not constitute proof that the Content item has been removed. A DRM solution should be used when Service Providers require a copy prevention mechanism.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item being returned.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Content item was returned successfully.

**returnContent** must either return true or a Fault; it must not return false.

A Service must return true if the Content item has already been returned prior to this call.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.1.7. The setProgressState Operation

Sets the Content access state for a given Content item. E.g. if a Reading System is about to start to download or streaming its state would be set to START and when completed would be set to FINISH.

If a [noActiveSession](#FAULT_NoActiveSession) Fault is returned, the Reading System will re-activate the Session with the Service to pass on the information

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

Contains the Content Identifier of the Content item for which the state is being set.

**state**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The following values are permitted as valid states.

**START**

A download or streaming is beginning which would result in resources returned by [**getContentResources**](#_5.1.4._The_getContentResources) being accessed.

**PAUSE**

A download or streaming is being paused. This is valid from a START state.

**RESUME**

A download or streaming is being resumed. This is valid from a PAUSE state.

**FINISH**

A download or streaming is finished. This is valid from either a START, PAUSE or RESUME state.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully set the state.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.1.8. The getTermsOfService Operation

Requests the [Terms of Service](#TERM_TermsOfService) from a Service. See [Managing Terms of Service](#_4.8._Managing_Terms) for a description of how this operation is used.

**Request parameters**

**getTermsOfService** takes no parameters.

**Response**

Type: [**label**](#_label_1)

Contains the terms of service for the Service.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [noActiveSession](#_5.3.2._The_noActiveSession), [termsOfServiceNotAccepted](#_5.3.6._The_termsOfServiceNotAccepte)

### 5.1.9. The acceptTermsOfService Operation

Marks the terms of service as accepted. See [Managing Terms of Service](#_4.8._Managing_Terms) for a description of how this operation is used.

**Request parameters**

**acceptTermsOfService** takes no parameters.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully marked the terms of service as accepted.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [noActiveSession](#_5.3.2._The_noActiveSession), [termsOfServiceNotAccepted](#_5.3.6._The_termsOfServiceNotAccepte)

## 5.2. Optional Operations

This section documents additional protocol operations that a Service may support. Note that even if a Service chooses not to support a given operation, it still must expose an operation with the same signature that faults with [operationNotSupported](#_5.3.3._The_operationNotSupported).

### 5.2.1. The getServiceAnnouncements Operation

Retrieves any announcements from the Service that a User has not yet read.

**Request parameters**

**getServiceAnnouncements** takes no parameters.

**Response**

Type: [**announcements**](#_6.1._The_announcements)

Contains the announcements from the Service.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.2. The markAnnouncementsAsRead Operation

Marks the specified announcement(s) as read.

This operation is only valid if a previous call to [**getServiceAnnouncements**](#_5.2.1._The_getServiceAnnouncements) has been made during the Session.

**Request parameters**

**read**

Type: [**read**](#_6.10._The_read)

Contains the IDs of the announcements to mark as read.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the announcements were successfully marked as read by the Service.  
  
**markAnnouncementsAsRead** must either return true or a Fault; it must not return false.  
  
A Service must return true if the announcement(s) is already marked as read when the call is made.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationFailed](#FAULT_OperationFailed), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.3. The setBookmarks Operation

Requests that a Service store the supplied bookmarks for a Content item.

This operation only supports the storage of bookmarks for one Content item at a time.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the bookmarks are associated with.

**bookmarkSet**

Type: [**bookmarkSet**](#_6.3._The_bookmarkSet)

Contains the bookmarks to store.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully stored the bookmarks.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.4. The getBookmarks Operation

Retrieves the bookmarks for a Content item from a Service.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the bookmarks are being retrieved for.

**Response**

Type: [**bookmarkObject**](#_6.2_The_bookmarkObject)

Contains the bookmarks for the Content item.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.5. The setLastmark Operation

Requests that a Service store the supplied lastmark for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the lastmark is associated with.

**lastmark**

Type: [**lastmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_440)

Contains the lastmark to store.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully stored the lastmark.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.6. The removeLastmark Operation

Requests that a Service remove the lastmark for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the lastmark is associated with.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully removed the lastmark.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.7. The setBookmark Operation

Requests that a Service store the supplied bookmark for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the bookmark is associated with.

**bookmark**

Type: [**bookmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_447)

Contains the bookmark to store.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully stored the bookmark.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.8. The removeBookmark Operation

Requests that a Service remove the supplied bookmark for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the bookmark is associated with.

**bookmark**

Type: [**bookmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_447)

Contains the bookmark to remove.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully removed the bookmark.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.9. The setHilite Operation

Requests that a Service store the supplied hilite for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the hilite is associated with.

**hilite**

Type: [**hilite**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_450)

Contains the hilite to store.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully stored the hilite.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.10. The removeHilite Operation

Requests that a Service remove the supplied hilite for a Content item.

**Request parameters**

**contentID**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the hilite is associated with.

**hilite**

Type: [**hilite**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_450)

Contains the hilite to remove.

**Response**

Type: [xs:boolean](http://www.w3.org/TR/xmlschema-2/#boolean) [[XML Schema 2]](#REF_XMLSchemaP2)

Specifies whether the Service successfully removed the hilite.

**Faults**

[internalServerError](#FAULT_InternalServerError), [invalidOperation](#FAULT_InvalidOperation), [invalidParameter](#FAULT_InvalidParameter), [operationNotSupported](#FAULT_OperationNotSupported), [noActiveSession](#FAULT_NoActiveSession), [termsOfServiceNotAccepted](#FAULT_TermsOfServiceNotAccepted)

### 5.2.12. The getLastmark operation

Retrieves the lastmark for a Content item from a Service.

**Request parameters**

**contentID**

Type: [xs:](http://www.w3.org/TR/xmlschema-2/#string)string [[XML Schema 2]](#REF_XMLSchemaP2)

The Content Identifier of the Content item the bookmarks are being retrieved for.

**Response**

Type: [**lastmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_440)

Contains the lastmark for the Content item.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [invalidParameter](#_5.3.5._The_invalidParameter), [operationNotSupported](#_5.3.3._The_operationNotSupported), [noActiveSession](#_5.3.2._The_noActiveSession), [termsOfServiceNotAccepted](#_5.3.6._The_termsOfServiceNotAccepte)

### 5.2.13. The getQuestions Operation

Retrieves a question from the series of questions that comprise the dynamic menu system.

**Request parameters**

**userResponses**

Type: [**userResponses**](#_6.16._The_userResponses)

Contains the response to a question, or, as defined in [**userResponse**](#_userResponse), one of the three reserved IDs: default, search or back.

**Response**

Type: [**questions**](#_6.9._The_questions)

Contains one or more multiple choice or input questions. May also contain a Label or [contentListRef](#_contentListRef) child elements.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [invalidParameter](#_5.3.5._The_invalidParameter), [operationNotSupported](#_5.3.3._The_operationNotSupported), [noActiveSession](#_5.3.2._The_noActiveSession), [termsOfServiceNotAccepted](#_5.3.6._The_termsOfServiceNotAccepte)

### 5.2.14. The getUserCredentials Operation

Retrieves the User credentials for a given Reading System based on the manufacturer and serial number supplied in the [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes).

**Request parameters**

**readingSystemAttributes**

Type: [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

Contains the Reading System attributes.

**Response**

**credentials**

Type: [**credentials**](#_6.6._The_credentials)

Contains the User credentials.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [invalidParameter](#_5.3.5._The_invalidParameter), [operationNotSupported](#_5.3.3._The_operationNotSupported)

#### getUserCredentials parameter / response examples

**Example 6.1 readingSystemAttributes**

<readingSystemAttributes xmlns="http://www.daisy.org/ns/daisy-online/">

<manufacturer>ACME Corporation</manufacturer>

<model>Pro Phantom III</model>

<serialNumber>64321</serialNumber>

<version>1.23</version>

<config>

<supportsMultipleSelections>true</supportsMultipleSelections>

<preferredUILanguage>en</preferredUILanguage>

<supportedContentFormats>

<contentFormat>ANSI/NISO Z39.86-2005</contentFormat>

<contentFormat>Daisy 2.02</contentFormat>

</supportedContentFormats>

<supportedContentProtectionFormats />

<supportedMimeTypes>

<mimeType type="text/plain" xml:lang="en"/>

<mimeType type="audio/mpeg"/>

</supportedMimeTypes>

<supportedInputTypes>

<input type="TEXT\_ALPHANUMERIC"/>

<input type="AUDIO"/>

</supportedInputTypes>

</config>

<requiresAudioLabels>false</requiresAudioLabels>

</readingSystemAttributes>

**Example 5.2 credentials**

<credentials xmlns="http://www.daisy.org/ns/daisy-online/">

<username>user</username>

<password>pass</password>

</credentials>

### 5.2.15. The getKeyExchangeObject Operation

Requests a [[PDTB2]](#REF_DAISYPDTB2) Key Exchange Object from a Service.

**Request parameters**

**requestedKeyName**

Type: [xs:string](http://www.w3.org/TR/xmlschema-2/#string) [[XML Schema 2]](#REF_XMLSchemaP2)

The identifier of the requested key.

**Response**

Type: [**KeyExchange**](#_6.7._The_KeyExchange)

A [[PDTB2]](#REF_DAISYPDTB2) Key Exchange Object, containing the requested key encrypted using one of the keys identified in the Reading System's key ring.

**Faults**

[internalServerError](#_5.3.1._The_internalServerError), [invalidOperation](#_5.3.4._The_invalidOperation), [invalidParameter](#_5.3.5._The_invalidParameter), [operationNotSupported](#_5.3.3._The_operationNotSupported), [noActiveSession](#_5.3.2._The_noActiveSession), [termsOfServiceNotAccepted](#_5.3.6._The_termsOfServiceNotAccepte)

## 5.3. Faults

When a Service responds to an operation with a SOAP Fault, an instance of one of the following types must be the child of the **detail** element.

Each of these Fault types has a **reason** child element, a **string** which can be used to send debugging information to the Reading System. This information should not be rendered to the User in most circumstances.

More than one Fault condition may be triggered when an operation is called. For example, an unsupported operation may be called outside of an active Session. In the case of two or more Fault conditions being applicable, the Fault that appears first in the fault precedence listed below must be issued. The fault precedence is as follows:

1. internalServerError
2. noActiveSession
3. operationNotSupported
4. invalidOperation
5. invalidParameter
6. termsOfServiceNotAccepted
7. operationFailed
8. unauthorized

The **detail** element may also optionally contain a **label** element. If existing, this **label** represents a human readable (if **audio** is included in the **label**, also playable) error message with any information that the Service wishes to communicate to the User, in order to explain the error. A Reading System receiving this **label** should present it to the User, if it has the capability of doing so.

### 5.3.1. The internalServerError Fault

Condition: an internal server error occurred on the Service and the execution of the operation was halted.

This Fault is issued when errors occur that are not described by the remaining available Faults. At the event of this Fault being issued, Reading Systems may attempt to call the operation that failed again.

### 5.3.2. The noActiveSession Fault

Condition: the operation is not allowed when there is no active session.

This Fault is issued on all operation calls except those in the operation sequence defined by the [Session Initialization Sequence](#_4.3.1._Session_Initialization) when a Session has either expired or not been successfully initialized.

### 5.3.3. The operationNotSupported Fault

Condition: the operation is not supported by the Service.

This Fault is issued when a Reading System calls an [optional operation](#_5.2._Optional_Operations) that the Service does not support.

### 5.3.4. The invalidOperation Fault

Condition: the operation is not valid in the current context

This Fault is issued when a Reading System during an active Session calls an operation at a stage when the call of another operation, or a set of other operations, is required.

### 5.3.5. The invalidParameter Fault

Condition: an invalid parameter was passed with the operation request.

This Fault is issued when a Reading System calls an operation with a parameter that the Service does not recognize, allow, or support.

### 5.3.6. The termsOfServiceNotAccepted Fault

Condition: the terms of service have not been accepted by the User.

This Fault is issued when a Reading System calls an operation before the terms of service have been accepted.

### 5.3.7. The operationFailed Fault

Condition: the operation was not successful.

This Fault is issued when a Reading System calls an operation and the outcome of the operation was not successful.

### 5.3.8. The unauthorized Fault

Condition: the User is not authorized to access this Service.

This Fault is issued when a Reading System calls a [**logOn**](#_5.1.1._The_logOn) operation and the user credentials fail to validate.

# 6. Type Reference

**This section is normative**

The following sections describe the elements defined in the [[XML Schema 1](#REF_XMLSchemaP1)] schema [do-types-10.xsd](http://www.daisy.org/projects/daisy-online-delivery/drafts/20100402/do-types-10.xsd" \t "_self), which is a normative part of the abstract WSDL document (refer to [Appendix A, *WSDL Abstract Definition*](#_Appendix_A._WSDL)).

**Note:**

The following simplified set of SGML syntax rules has been used throughout this section to define the content models:

* parentheses are used to group sets of elements and/or other groups;
* within groups, a comma ',' indicates required sequences and a pipe '|' indicates optional sequences; and
* a question mark '?' after a group or element indicates the item must occur zero or one times, a plus sign '+' indicates one or more, an asterisk '\*' zero or more and no modifier means the element or group must occur exactly once.

In the case of any discrepancies between the descriptions in this specification and the definitions in [do-types-10.xsd](http://www.daisy.org/projects/daisy-online-delivery/drafts/20100402/do-types-10.xsd), the latter shall be taken as authoritative.

## 6.1. The announcements Type

A list of [Service announcements](#_4.5._Service_Announcements).

#### Used By

[getServiceAnnouncements](#_5.2.1._The_getServiceAnnouncements) (response)

#### Content Model

( [**announcement**](#_announcement)\* )

**6.1.1. announcements Examples**

**Example 6.1. announcements**

<announcements xmlns="http://www.daisy.org/ns/daisy-online/">

<announcement id="downtime" priority="1" type="WARNING">

<label xml:lang="en">

<text>The Service will not be available for 30 minutes from 1:30pm today, Friday the 10th of September due to maintenance.</text>

<audio uri="http://example.com/content/messages/current.mp3" rangeBegin="0" rangeEnd="65856"

size="65856"/>

</label>

</announcement>

<announcement id="survey" priority="2" type="INFORMATION">

<label xml:lang="en">

<text>A new survey is available, fill it in online at our home page, or use your Daisy Online

Reading System if it has the required capabilities. Chance to win a Phantom Pocket

Reader!</text>

<audio uri="http://example.com/content/messages/current.mp3" rangeBegin="65857" size="92112"/>

</label>

</announcement>

</announcements>

## 6.2 The bookmarkObject Type

#### Used By

[getBookmarks](#_5.2.4._The_getBookmarks) (response)

#### Content Model

( [**bookmarkSet**](#_6.3._The_bookmarkSet) )

#### Attributes

**lastModifiedDate**

The last modified time of the bookmark object.

***Use:*** optional

***Data type:* xs:dateTime**

## 6.3. The bookmarkSet Type

#### Used By

[setBookmarks](#_5.2.3._The_setBookmarks) (parameter)  
[getBookmarks](#_5.2.4._The_getBookmarks) (response)

#### Content Model

( [**title**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_433), [**uid**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_439), [**lastmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_440)?, ( [**bookmark**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_447) | [**hilite**](http://www.daisy.org/z3986/2005/Z3986-2005.html#li_450) )\* )

## 6.4. The contentList Type

A full or partial list of Content items.

#### Used By

[getContentList](#_5.1.5._The_getContentList) (response)

#### Content Model

( [**label**](#_label_1)?, [**contentItem**](#_contentItem)\*)

#### Attributes

**totalItems**

The total number of **contentItem**s in the whole list. If this is just a part of the list, then totalItems will be greater than the number of [**contentItem**](#_contentItem)s returned; otherwise, they will be equal.

***Use:*** required

***Data type:* xs:int**

**firstItem**

The 0-based index of the first [**contentItem**](#_contentItem) in this **contentList** within the whole list. This attribute must be provided if this is a partial list. If this attribute is present, the lastItem attribute must also be present.

***Use:*** optional

***Data type:* xs:int**

**lastItem**

The 0-based index of the last [**contentItem**](#_contentItem) in this **contentList** within the whole list. This attribute must be provided if this is a partial list. If this attribute is present, the firstItem attribute must also be present.

***Use:*** optional

***Data type:* xs:int**

**id**

The identifier of the **contentList**.

The identifier may be the reserved value bookshelf or may be an arbitrary value, typically exposed in a [contentListRef](#_contentListRef) at an [end point](#_4.7.5._End_Points) in a [dynamic menu](#_4.7._Dynamic_Menus) operation sequence.

Services should persist **contentList** identifiers for the duration of a Session. Services must not expose multiple **contentList**s with the same arbitrary identifier during the same session.

***Use:*** required

***Data type:* xs:NMTOKEN**

### 6.4.1. contentList Examples

**Example 6.2. A complete contentList with audio labels**

This example shows a complete **contentList** (the firstItem and lastItem attributes are not present in the root element).

<contentList xmlns="http://www.daisy.org/ns/daisy-online/"

id="cl123" totalItems="2">

<label xml:lang="en">

<text>Please select from these publications.</text>

<audio uri="http://example.com/static/PleaseChooseFrom.mp3" size="12342"/>

</label>

<contentItem id="com-example-001">

<label xml:lang="en">

<text>Harry Potter and the Chamber of Secrets</text>

<audio uri="http://example.com/content/titles/hp\_cs.mp3" size="130821"/>

</label>

</contentItem>

<contentItem id="com-example-002">

<label xml:lang="en">

<text>Harry Potter and the Goblet of Fire</text>

<audio uri="http://example.com/content/titles/hp\_gf.mp3" size="130821"/>

</label>

</contentItem>

</contentList>

**Example 6.3. A partial contentList**

This example shows a partial **contentList** (firstItem and lastItem attributes specify which of the items are included in this segment).

<contentList xmlns="http://www.daisy.org/ns/daisy-online/"

id="cl125" firstItem="0" lastItem="1" totalItems="25">

<label xml:lang="en">

<text>Please select from these publications.</text>

</label>

<contentItem id="com-example-001">

<label xml:lang="en">

<text>Harry Potter and the Chamber of Secrets</text>

</label>

</contentItem>

<contentItem id="com-example-002">

<label xml:lang="en">

<text>Harry Potter and the Goblet of Fire</text>

</label>

</contentItem>

</contentList>

## 6.5. The contentMetadata Type

The metadata of a Content item.

#### Used By

#### Content Model

( [**sample**](#_sample)?, [**metadata**](#_metadata) **,** [**categoryLabel**](#_categoryLabel)**?,** [**subCategoryLabel**](#_subCategoryLabel)**?,** [**supportsDownload**](#_supportsDownload)**,** [**supportsStreaming**](#_supportsStreaming)**,** [**supportsRestrictedDownload**](#_supportsRestrictedDownload))

#### Attributes

**category**

The publication category of the Content item.

Reading Systems may use the value provided here to categorize or sort Content items.

Any value is allowed. The values BOOK, MAGAZINE, NEWSPAPER and OTHER are recommended for those Content items which match one of these terms.

***Use:*** optional

***Data type:* xs:string**

**subCategory**

The publication sub category of the Content item.

Reading Systems may use the value provided here to categorize or sort Content items.  
  
Any value is allowed. This value is to be computer interpreted by the Reading Systems, thus should not be localized.

***Use:*** optional

***Data type:* xs:string**

**returnBy**

Specifies the time when the Service Provider requires this Content item to be returned.

This attribute may change value while the Content item is on a User’s bookshelf. E.g. another process (such as Service Provider staff member) may change this date to extend the Loan of this item.

This attribute does not constitute a contract.

***Use:*** optional

***Data type:* xs:dateTime**

**availableForAutomaticDownload**

Specifies whether this Content item is available for automatic download.  
  
A Service may set this to true if performsAutomaticDownload in the [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes) has been set to true by the Reading System.

***Use:*** optional

***Data type:* xs:boolean**

***Default Value:* false**

### 6.5.1. contentMetadata Examples

**Example 6.4. Example contentMetadata**

This example shows the **contentMetadata** for a borrowed book that is [[PDTB2](#REF_DAISYPDTB2)] protected (see [Section 4.4.6, “Rights management”](#_4.4.5._Rights_management)) and that has a cover. This book is available for streaming but not downloading, although it is available for restricted download.

<contentMetadata xmlns="http://www.daisy.org/ns/daisy-online/" category="BOOK">

<sample id="hp\_cos-sample"/>

<metadata xmlns:dc="http://purl.org/dc/elements/1.1/">

<dc:title>Harry ignores warnings not to return to Hogwarts, only to find the school plagued by a series of mysterious attacks and a strange voice haunting him.</dc:title>

<dc:identifier>com-example-hp\_cos</dc:identifier>

<dc:format>Daisy 2.02</dc:format>

<dc:language>en-GB</dc:language>

<dc:description>This book </dc:description>

<narrator>Mary Svensson</narrator>

<size>8119213</size>

<meta name="pdtb2:specVersion" content="2005-1" />

<meta name="cover" content="http://example.com/image.png" />

</metadata>

<supportsDownload>false</supportsDownload>

<supportsStreaming>true</supportsStreaming>

<supportsRestrictedDownload>true</supportsRestrictedDownload >

</contentMetadata>

## 6.6. The credentials Type

The user credentials used to support automatic device configuration.

#### Used By

[getUserCredentials](#_5.2.14._The_getUserCredentials) (response)

#### Content Model

( [**username**](#_username), [**password**](#_password) )

### 6.6.1. credentials Examples

**Example 6.5. credentials**

<credentials xmlns="http://www.daisy.org/ns/daisy-online/">

<username>user</username>

<password>pass</password>

</credentials>

## 6.7. The KeyExchange Type

#### Used By

[getKeyExchangeObject](#_5.2.15._The_getKeyExchangeObject) (response)

#### Content Model

( [**Issuer**](http://www.daisy.org/projects/pdtb/daisy-pdtb-spec.html#s6.1), ( [**ds:KeyInfo**](http://www.daisy.org/projects/pdtb/daisy-pdtb-spec.html#s6.1) | [**Keys**](http://www.daisy.org/projects/pdtb/daisy-pdtb-spec.html#s6.1) )+ )

## 6.8. The keyRing Type

A list of key names.

#### Used By

#### Content Model

( [**item**](#_item)\* )

## 6.9. The questions Type

A sequence of questions.

The **questions** element must contain either:

* exactly one [**contentListRef**](#_contentListRef); or
* exactly one [**label**](#_label_1); or
* one or more [**multipleChoiceQuestion**](#_multipleChoiceQuestion)s and/or [**inputQuestion**](#_inputQuestion)s, in any order.

If the **questions** element contains a [**contentListRef**](#_contentListRef) or a [**label**](#_label_1) child element, it is an endpoint to the sequence of questions that comprise a dynamic menu.

For informative examples on the usage of the **questions** type, refer to the [[Dynamic Menus Primer]](#REF_DynamicMenusPrimer).

#### Used By

[getQuestions](#_5.2.13._The_getQuestions) (response)

#### Content Model

( ( [**multipleChoiceQuestion**](#_multipleChoiceQuestion) | [**inputQuestion**](#_inputQuestion) )+ | [**contentListRef**](#_contentListRef) | [**label**](#_label_1) )

## 6.10. The read Type

A list of [announcement](#_announcement) identifiers.

#### Used By

[markAnnouncementsAsRead](#_5.2.2._The_markAnnouncementsAsRead) (parameter)

#### Content Model

( [**item**](#_item)\* )

## 6.11. The readingSystemAttributes Type

Specifies Reading System properties.

The properties specified are valid until the end of the Session.

#### Used By

[logon](#_5.1.1._The_logOn) (parameter)

#### Content Model

### ( [manufacturer](#_manufacturer), [model](#_model), [serialNumber](#_serialNumber)?, [version](#_version), [config](#_config) )

This element is extensible.

### 6.11.1. readingSystemAttributes Examples

**Example 6.6. readingSystemAttributes for a portable audio-centric Reading System**

This example shows **readingSystemAttributes** for a small portable audio-centric Reading System (single format support, numeric input, no text-to-speech capabilities, PDTB2 support).

<readingSystemAttributes xmlns="http://www.daisy.org/ns/daisy-online/">

<manufacturer>ACME Corporation</manufacturer>

<model>Pocket Phantom</model>

<serialNumber>123456</serialNumber>

<version>1.23</version>

<config>

<supportsDownload>false</supportsDownload>

<supportsStreaming>true</supportsStreaming>

<supportsRestrictedDownload>false</supportsRestrictedDownload>

<supportsMultipleSelections>false</supportsMultipleSelections>

<preferredUILanguage>en</preferredUILanguage>

<bandwidth>8000000</bandwidth>

<supportedContentFormats>

<contentFormat>ANSI/NISO Z39.86-2005</contentFormat>

<contentFormat>application/zip</contentFormat>

</supportedContentFormats>

<supportedContentProtectionFormats>

<protectionFormat>PDTB2</protectionFormat>

</supportedContentProtectionFormats>

<keyRing>

<item>DAISY.lv-acme.ACME</item>

<item>DAISY.lv-acme.Phantom-1</item>

<item>DAISY.lv-acme.SN123456</item>

<item>DAISY.ca-qqhb.006442</item>

<item>DAISY.au-atbi.userKey-4C452DB4</item>

</keyRing>

<supportedMimeTypes>

<mimeType type="audio/mpeg"/>

</supportedMimeTypes>

<supportedInputTypes>

<input type="TEXT\_NUMERIC" />

</supportedInputTypes>

<requiresAudioLabels>true</requiresAudioLabels>

<supportsResourcePackages>true</supportsResourcePackages>

<performsAutomaticDownload>false</performsAutomaticDownload>

</config>

</readingSystemAttributes>

**Example 6.7. readingSystemAttributes for a more functional Reading System**

This example shows the **readingSystemAttributes** for a more functional Reading System, such as a software Reading System (multi-format support, full keyboard input, built-in text-to-speech capabilities but in this case no PDTB2 support).

<readingSystemAttributes xmlns="http://www.daisy.org/ns/daisy-online/">

<manufacturer>ACME Corporation</manufacturer>

<model>Pro Phantom III</model>

<serialNumber>64321</serialNumber>

<version>1.23</version>

<config>  
 <supportsDownload>true</supportsDownload>  
 <supportsStreaming>true</supportsStreaming>  
 <supportsRestrictedDownload>true</supportsRestrictedDownload>  
 <supportsMultipleSelections>true</supportsMultipleSelections>

<preferredUILanguage>en</preferredUILanguage>

<supportedContentFormats>

<contentFormat>ANSI/NISO Z39.86-2005</contentFormat>

<contentFormat>Daisy 2.02</contentFormat>

</supportedContentFormats>

<supportedContentProtectionFormats />

<supportedMimeTypes>

<mimeType type="text/plain" xml:lang="en"/>

<mimeType type="audio/mpeg"/>

</supportedMimeTypes>

<supportedInputTypes>

<input type="TEXT\_ALPHANUMERIC"/>

<input type="AUDIO"/>

</supportedInputTypes>

<requiresAudioLabels>false</requiresAudioLabels>

<supportsResourcePackages>true</supportsResourcePackages>

<performsAutomaticDownload>false</performsAutomaticDownload>

</config>

</readingSystemAttributes>

## 6.12. The readingSystemList Type

The list of DAISY Consortium approved Reading Systems available to a given Service.

#### Used By

Used as source data by a Service to support automatic configuration.

#### Content Model

( [**readingSystem**](#_readingSystem)\* )

### 6.12.1. readingSystemList Examples

**Example 6.8. readingSystemList**

<readingSystemList xmlns="http://www.daisy.org/ns/daisy-online/">   
 <readingSystem>  
 <manufacturer>Shinano Kenshi Co.,Ltd.</manufacturer>  
 <model>PTX1Pro</model>  
 <publicKey>http://daisy.plextalk.com/key</publicKey>  
 </readingSystem>  
</readingSystemList>

## 6.13. The resources Type

A list of all the resources that constitute the Content item.

#### Used By

[getContentResources](#_5.1.4._The_getContentResources) (response)

#### Content Model

( [**resource**](#_resource)+ )

#### Attributes

**lastModifiedDate**

The last modified time of the Content item.

***Use:*** optional

***Data type:* xs:dateTime**

### 6.13.1. resources Examples

**Example 6.9. A resources instance using script URIs**

This example shows a **resources** instance where the uri attribute refers to a script that does not expose the names of the resources.

<resources xmlns="http://www.daisy.org/ns/daisy-online/">

<resource mimeType="text/xml" size="123456"

uri="https://example.com/content/get.php?a123891"

localURI="package.opf"/>

<resource mimeType="application/x-dtbncx+xml" size="123456"

uri="https://example.com/content/get.php?a123892"

localURI="nav.ncx"/>

<resource mimeType="application/smil" size="567890"

uri="https://example.com/content/get.php?a123893"

localURI="chapter\_1.smil"/>

<resource mimeType="audio/mpeg" size="123456789"

uri="https://example.com/content/get.php?a123894"

localURI="chapter\_1.mp3"/>

<resource mimeType="image/jpeg" size="23456"

uri="https://example.com/content/get.php?a123895"

localURI="./images/sun001.jpg"/>

</resources>

**Example 6.10 A resources instance using script URIs that uses packages**

This example shows a **resources** instance where a few **resource**s can also be downloaded as part of a package.

<resources xmlns="http://www.daisy.org/ns/daisy-online/">

<resource mimeType="text/xml" size="123456"

uri="https://example.com/content/get.php?a123891"

localURI="package.opf"

packageURI="https://example.com/content/get.php?123"

packageMimeType="application/zip"

packageSize="987"/>

<resource mimeType="application/x-dtbncx+xml" size="123456"

uri="https://example.com/content/get.php?a123892"

localURI="nav.ncx"

packageURI="https://example.com/content/get.php?123"

packageMimeType="application/zip"

packageSize="987"/>

<resource mimeType="application/smil" size="567890"

uri="https://example.com/content/get.php?a123893"

localURI="chapter\_1.smil"

packageURI="https://example.com/content/get.php?123"

packageMimeType="application/zip"

packageSize="987"/>

<resource mimeType="audio/mpeg" size="123456789"

uri="https://example.com/content/get.php?a123894"

localURI="chapter\_1.mp3"/>

<resource mimeType="image/jpeg" size="23456"

uri="https://example.com/content/get.php?a123895"

localURI="./images/sun001.jpg"/>

</resources>

**Example 6.11 A resources instance using script URIs containing a single package**

This example shows a **resources** instance where the Service presents only a single zip **resource**.

<resources xmlns="http://www.daisy.org/ns/daisy-online/">

<resource mimeType="application/zip" size="123"

uri="https://example.com/content/get.php?a123"

localURI="package.zip"/>

</resources>

## 6.14. The serviceAttributes Type

Properties of the Service.

The properties specified must be constant for the duration of the Session.

#### Used By

[logOn](#_5.1.1._The_logOn) (response)

#### Content Model

( [**serviceProvider**](#_serviceProvider)?, [**service**](#_service)?, [**supportsServerSideBack**](#_supportsServerSideBack), [**supportsSearch**](#_supportsSearch), [**supportedUplinkAudioCodecs**](#_supportedUplinkAudioCodecs), [**supportsAudioLabels**](#_supportsAudioLabels), [**supportedOptionalOperations**](#_supportedOptionalOperations), [**supportsDownload**](#_supportsDownload), [**supportsStreaming**](#_supportsStreaming), [**supportsRestrictedDownload**](#_supportsRestrictedDownload), [**announcementsPullFrequency**](#_announcementsPullFrequency) )

##### Example 6.12. serviceAttributes for a minimal library Service

This example shows the **serviceAttributes** for a Service that only supports streaming.

<serviceAttributes xmlns="http://www.daisy.org/ns/daisy-online/">

<serviceProvider id="uk.com.example" />

<service id="uk.com.example.libraryServiceBasic" />

<supportsServerSideBack>false</supportsServerSideBack>

<supportsSearch>false</supportsSearch>

<supportedUplinkAudioCodecs>

<codec>audio/mpeg</codec>

</supportedUplinkAudioCodecs>

<supportsAudioLabels>true</supportsAudioLabels>

<supportedOptionalOperations>

<operation>SET\_BOOKMARKS</operation>

<operation>GET\_BOOKMARKS</operation>

<operation>SERVICE\_ANNOUNCEMENTS</operation>

</supportedOptionalOperations>

<supportsDownload>false</supportsDownload>

<supportsStreaming>true</supportsStreaming>

<supportsRestrictedDownload>false</supportsRestrictedDownload >

<announcementsPullFrequency>15</announcementsPullFrequency>

</serviceAttributes>

##### Example 6.13. serviceAttributes for a fuller Service

This example shows the **serviceAttributes** for a Service that provides some or all of its Content protected using [PDTB2]. This Service also supports both download and streaming (including restricted downloads).

<serviceAttributes xmlns="http://www.daisy.org/ns/daisy-online/">

<serviceProvider id="gy-zenith" />

<service id="gy-zenith-libraryServiceDeluxe" />

<supportsServerSideBack>true</supportsServerSideBack>

<supportsSearch>true</supportsSearch>

<supportedUplinkAudioCodecs>

<codec>audio/mpeg</codec>

</supportedUplinkAudioCodecs>

<supportsAudioLabels>true</supportsAudioLabels>

<supportedOptionalOperations>

<operation>DYNAMIC\_MENUS</operation>

<operation>SET\_BOOKMARKS</operation>

<operation>GET\_BOOKMARKS</operation>

<operation>SERVICE\_ANNOUNCEMENTS</operation>

<operation>PDTB2\_KEY\_PROVISION</operation>

</supportedOptionalOperations>

<supportsDownload>true</supportsDownload>

<supportsStreaming>true</supportsStreaming>

<supportsRestrictedDownload>true</supportsRestrictedDownload >

</serviceAttributes>

## 6.15. The serviceList Type

The list of Services available to a given Reading System sourced from the DAISY Consortium.

#### Used By

Used as source data by a Reading System to support automatic configuration.

#### Content Model

( [**service**](#_service)\* )

### 6.15.1. serviceList Examples

**Example 6.14. serviceList**

<serviceList xmlns="http://www.daisy.org/ns/daisy-online/">

<!-- Vision Australia -->

<service>

<name>Vision Australia</name>

<url>https://something.visionaustralia.org/service.svc</url>

<website>http://www.visionaustralia.org/</website>

<phone>611300654656</phone>

<country>au</country>

<languages>

<language>en</language>

</languages>

<latitude>-37.8471942</latitude>

<longitude>145.0082843,13</longitude>

</service>

<!-- CNIB -->

<service>

<name>CNIB</name>

<url>https://smething.cniblibrary.com/DOService/DaisyOService</url>

<website>http://www.cniblibrary.com/</website>

<phone>611300654656</phone>

<country>ca</country>

<languages>

<language>en</language>

<language>fr</language>

</languages>

<latitude>43.717457</latitude>

<longitude>-79.3779645,17</longitude>

</service>

</serviceList>

## 6.16. The userResponses Type

A set of User responses to [**questions**](#_6.9._The_questions) provided by the Service.

For informative examples of the **userResponses** type, refer to the [[Dynamic Menus Primer]](#REF_DynamicMenusPrimer).

#### Used By

[getQuestions](#_5.2.13._The_getQuestions) (parameter)

#### Content Model

( [**userResponse**](#_userResponse)+ )

## 6.17. Element Reference

### additionalTransferProtocols

Specifies any additional transfer protocols that are supported by the Reading System, beyond HTTP and HTTPS.

#### Properties

***Content model:*** ( [**protocol**](#_protocol)+ )

***Parent(s):*** [**config**](#_config)

### announcement

A Service announcement.

#### Properties

***Content model:*** ( [**label**](#_label_1) )

***Parent(s):*** [**announcements**](#_6.1._The_announcements)

#### Attributes

**id**

The identifier of this announcement. This identifier is only valid for the duration of a Session.

***Use:*** required

***Data type:* xs:NMTOKEN**

**type**

A value that indicates the nature of this announcement.

***Use:*** optional

Enumeration:+

* WARNING
* ERROR
* INFORMATION
* SYSTEM

***Default Value:*** INFORMATION

**priority**

The priority of this announcement. 1 is the highest priority and 3 is the lowest.

***Use:*** optional

Integer Set:

* minimum value: 1
* maximum value: 3

***Default Value:*** 3

### announcementsPullFrequency

The pulling frequency (in minutes) of announcements, i.e. the number of minutes between calls from the Reading System to check for announcements.

#### Properties

***Data type:* xs:int**

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### audio

#### Properties

***Content model:*** empty element

***Parent(s):*** [**label**](#_label_1)

#### Attributes

**uri**

The URI of the audio component of the label.

***Use:*** required

***Data type:* xs:anyURI**

**rangeBegin**

The byte offset of the start of the audio label in the resource named in the uri attribute. If the rangeBegin attribute is not present, the start offset is 0.

***Use:*** optional

***Data type:* xs:long**

**rangeEnd**

The byte offset of the end of the audio label in the resource named in the uri attribute. If the rangeEnd attribute is not present, the end is the last byte of the resource.

***Use:*** optional

***Data type:* xs:long**

**size**

The size, in bytes, of the label's audio data.

***Use:*** optional

***Data type:* xs:long**

### bandwidth

An estimate of the bandwidth that the Reading System allocates for the Session, in kilobits per second.

#### Properties

***Data type:* xs:int**

***Parent(s):*** [**config**](#_config)

### categoryLabel

The human readable, localized, label for the category of a Content item.

#### Properties

***Content model:*** ( [**label**](#_label_1) )

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata)

### choice

#### Properties

***Content model:*** ( [**label**](#_label_1) )

***Parent(s):*** [**choices**](#_choices)

#### Attributes

**id**

***Use:*** required

***Data type:* xs:NMTOKEN**

### choices

#### Properties

***Content model:*** ( [**choice**](#_choice)+ )

***Parent(s):*** [**multipleChoiceQuestion**](#_multipleChoiceQuestion)

### codec

The codec's [[MIME]](#REF_MIMEPart2MediaTypes) type.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**supportedUplinkAudioCodecs**](#_supportedUplinkAudioCodecs)

### config

#### Properties

***Content model:*** ( [**supportsDownload**](#_supportsDownload), [**supportsStreaming**](#_supportsStreaming), [**supportsRestrictedDownload**](#_supportsRestrictedDownload), [**supportsMultipleSelections**](#_supportsMultipleSelections), [**preferredUILanguage**](#_preferredUILanguage), [**bandwidth**](#_bandwidth)?, [**supportedContentFormats**](#_supportedContentFormats), [**supportedContentProtectionFormats**](#_supportedContentProtectionFormats), [**keyRing**](#_6.8._The_keyRing)?, [**supportedMimeTypes**](#_supportedMimeTypes), [**supportedInputTypes**](#_supportedInputTypes), [**requiresAudioLabels**](#_requiresAudioLabels), [**additionalTransferProtocols**](#_additionalTransferProtocols)? , [**supportsResourcePackages**](#_supportsResourcePackages), [**performsAutomaticDownload**](#_performsAutomaticDownload)  )

***Parent(s):*** [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

### contentFormat

The content of this element follows the convention of the [[Dublin Core]](#REF_DublinCoreMetadataElementSetV11) Format element.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**supportedContentFormats**](#_supportedContentFormats)

### contentItem

A single Content item.

**Properties**

***Content model:*** ( [**label**](#_label_1), [**contentMetadata**](#_6.5._The_contentMetadata), [**lastmark**](#REF_Z3986_2005)? )

***Parent(s):*** [**contentList**](#_6.4._The_contentList)

**Attributes**

**id**

The Content Identifier of this Content item.

***Use:*** required

***Data type:* xs:string**

**firstAccessedDate**

A timestamp representing when a [**contentItem**](#_contentItem) was first accessed.  
  
If a Content item has not yet been accessed, this attribute should be Null.

***Use:*** required

***Data type:* xs:dateTime**

**lastAccessedDate**

A timestamp representing when a [**contentItem**](#_contentItem) was last accessed.  
  
If a Content item has not yet been accessed, this attribute should be Null.

***Use:*** required

***Data type:* xs:dateTime**

**lastModifiedDate**

The last modified time of the Content item.

***Use:*** optional

***Data type:* xs:dateTime**

### contentListRef

The identifier of a [**contentList**](#_6.4._The_contentList).

A **contentListRef** as a child of the **questions** element indicates an endpoint of the sequence of questions that comprise a dynamic menu.

#### Properties

***Data type:* xs:NMTOKEN**

***Parent(s):*** [**questions**](#_6.9._The_questions)

### country

The country where a given Service Provider resides.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### data

The base64-encoded data of an audio User response.

Services must accept audio in the [[RIFF WAVE]](#REF_RiffWave) format. Services may support additional audio formats, and must specify those formats in [**serviceAttributes**](#_6.14._The_serviceAttributes).

#### Properties

***Allowed values:* xs:base64Binary**

***Parent(s):*** [**userResponse**](#_userResponse)

### email

A valid email address that can be used by the Reading System or User to contact the Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### input

#### Properties

***Content model:*** empty element

***Parent(s):*** [**inputTypes**](#_inputTypes), [**supportedInputTypes**](#_supportedInputTypes)

#### Attributes

**type**

***Use:*** required

Enumeration:

* TEXT\_NUMERIC

The Reading System supports numeric input.

The Service allows numeric-only responses to the question.

* TEXT\_ALPHANUMERIC

The Reading System supports text and numeric input.

The Service allows text and numeric responses to the question.

* AUDIO

The Reading System supports audio input.

The Service allows audio responses to the question.

### inputQuestion

An input field that accepts a text or audio response.

#### Properties

***Content model:*** ( [**inputTypes**](#_inputTypes), [**label**](#_label_1) )

***Parent(s):*** [**questions**](#_6.9._The_questions)

#### Attributes

**id**

***Use:*** required

***Data type:* xs:NMTOKEN**

### inputTypes

Specifies which input types the Service will accept in response to the question.

#### Properties

***Content model:*** ( [**input**](#_input)+ )

***Parent(s):*** [**inputQuestion**](#_inputQuestion)

### item

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**keyRing**](#_6.8._The_keyRing), [**read**](#_6.10._The_read)

### label

A multi-purpose label, containing text and optionally audio.

To achieve maximum interoperability, Services should support the provision of audio labels, as Reading Systems may [require](#_requiresAudioLabels) them in order to render Service messages to the user.

#### Properties

***Content model:*** ( [**text**](#_text), [**audio**](#_audio)? )

***Parent(s):*** [**announcement**](#_announcement), [**categoryLabel**](#_categoryLabel), [**choice**](#_choice), [**contentItem**](#_contentItem), [**contentList**](#_6.4._The_contentList), [**inputQuestion**](#_inputQuestion), [**multipleChoiceQuestion**](#_multipleChoiceQuestion), [**questions**](#_6.9._The_questions), [**service**](#_service), [**serviceProvider**](#_serviceProvider), [**subCategoryLabel**](#_subCategoryLabel)

#### Attributes

**xml:lang**

The language of the label.

***Use:*** required

**dir**

The direction of the text.

***Use:*** optional

Enumeration:

* ltr

Left-to-right.

* rtl

Right-to-left.

### language

A 2 digit language code representing a language supported by a given Service Provider as defined by [ISO 639-1](http://www.iso.org/iso/home/standards/language_codes.htm).

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**languages**](#_languages)

### languages

A set of languages supported by a given Service Provider.

**Properties**

***Content model:*** ( [**language**](#_language)\* )

***Parent(s):*** [**service**](#_service)

### latitude

A valid latitude that goes to describing the location of the Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### longitude

A valid longitude that goes to describing the location of the Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### manufacturer

The manufacturer of the Reading System.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

### meta

An arbitrary metadata element. Allows custom metadata fields from schemes other than Dublin Core.

#### Properties

***Content model:*** empty element

***Parent(s):*** [**metadata**](#_metadata)

#### Attributes

**name**

***Use:*** required

***Data type:* xs:string**

**content**

***Use:*** required

***Data type:* xs:string**

### metadata

Bibliographic and other metadata of the Content item.

Elements in the Dublin Core namespace are normatively defined by [[Dublin Core]](#REF_DublinCoreMetadataElementSetV11). The value of the Dublin Core identifier element must match the Content Identifier of the Content item.

Additional, non-Dublin Core metadata may be provided using the generic [**meta**](#_meta) element.

The prefix pdtb2: in the name attribute of a [**meta**](#_meta) element is reserved to refer to properties of [[PDTB2]](#REF_DAISYPDTB2).

The value pdtb2:specVersion in the name attribute of a [**meta**](#_meta) element means that the Content item is protected using [[PDTB2]](#REF_DAISYPDTB2)

#### A [meta](#_meta) element with cover in the name attribute will contain the url for the cover image of the Content item in the content attribute (see Example 6.4. Example contentMetadata).

#### [dc:description](http://dublincore.org/documents/dces/#description) can be used for the Content item’s Synopsis.

#### Properties

***Content model:*** ( [**dc:title**](http://dublincore.org/documents/dces/#title), [**dc:identifier**](http://dublincore.org/documents/dces/#identifier), [**dc:publisher**](http://dublincore.org/documents/dces/#publisher)?, [**dc:format**](http://dublincore.org/documents/dces/#format), [**dc:date**](http://dublincore.org/documents/dces/#date)?, [**dc:source**](http://dublincore.org/documents/dces/#source)?, [**dc:type**](http://dublincore.org/documents/dces/#type)\*, [**dc:subject**](http://dublincore.org/documents/dces/#subject)\*, [**dc:rights**](http://dublincore.org/documents/dces/#rights)\*, [**dc:relation**](http://dublincore.org/documents/dces/#relation)\*, [**dc:language**](http://dublincore.org/documents/dces/#language)\*, [**dc:description**](http://dublincore.org/documents/dces/#description)\*, [**dc:creator**](http://dublincore.org/documents/dces/#creator)\*, [**dc:coverage**](http://dublincore.org/documents/dces/#coverage)\*, [**dc:contributor**](http://dublincore.org/documents/dces/#contributor)\*, [**narrator**](#_narrator)\*, [**size**](#_size), [**meta**](#_meta)\* )

This element is extensible.

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata)

### mimeType

#### Properties

***Content model:*** empty element

***Parent(s):*** [**supportedMimeTypes**](#_supportedMimeTypes)

#### Attributes

**type**

A [[MIME]](#REF_MIMEPart2MediaTypes) type.

***Use:*** required

***Data type:* xs:string**

**xml:lang**

***Use:*** optional

### model

The model name or designation of the Reading System.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

### multipleChoiceQuestion

#### Properties

***Content model:*** ( [**label**](#_label_1), [**choices**](#_choices) )

***Parent(s):*** [**questions**](#_6.9._The_questions)

#### Attributes

**id**

***Use:*** required

***Data type:* xs:NMTOKEN**

**allowMultipleSelections**

Specifies whether multiple selections are allowed in the User response to this question.

***Use:*** optional

***Data type:* xs:boolean**

***Default Value:*** false

### name

The display name of the Service Provider’s DAISY Online service.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### narrator

In the case of audio Content, the name of the narrator.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**metadata**](#_metadata)

### operation

One of the optional operations or groups of optional operations defined below.

#### Properties

***Allowed values:***

* SET\_BOOKMARKS

This Service supports the [**setBookmarks**](#_5.2.3._The_setBookmarks) operation.

* GET\_BOOKMARKS

This Service supports the [**getBookmarks**](#_5.2.4._The_getBookmarks) operation.

* DYNAMIC\_MENUS

This Service supports the [**getQuestions**](#_5.2.13._The_getQuestions) operation.

* SERVICE\_ANNOUNCEMENTS

This Service supports the [**getServiceAnnouncements**](#_5.2.1._The_getServiceAnnouncements) and [**markAnnouncementsAsRead**](#_5.2.2._The_markAnnouncementsAsRead) operations.

* PDTB2\_KEY\_PROVISION

This Service supports the [**getKeyExchangeObject**](#_5.2.15._The_getKeyExchangeObject) operation.

***Parent(s):*** [**supportedOptionalOperations**](#_supportedOptionalOperations)

### password

A valid password for the given Service that can be used with its corresponding username for authentication against a compliant Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**credentials**](#_6.6._The_credentials)

### performsAutomaticDownload

Specifies whether the Reading System performs automatic download.

If this element is set to true, the Service may present availableForAutomaticDownload for [**contentMetadata**](#_6.5._The_contentMetadata).

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**config**](#_config)

### phone

A valid phone number that can be used by a User to contact the Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#_service)

### preferredUILanguage

The user's preferred language of communication with the Service.

#### Properties

***Data type:* xs:language**

***Parent(s):*** [**config**](#_config)

### protectionFormat

#### Properties

***Allowed values:***

* PDTB2

This Reading System supports [DAISY Protected Digital Talking Book 2](#REF_DAISYPDTB2).

***Parent(s):*** [**supportedContentProtectionFormats**](#_supportedContentProtectionFormats)

### protocol

The identifier of a transfer protocol. Identifiers are as given in the protocol's specification.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**additionalTransferProtocols**](#_additionalTransferProtocols)

### publicKey

The url to a valid public key for the given Reading System that can be used to encrypt data from the Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**readingSystem**](#_readingSystem)

### readingSystem

Contains the definition of an approved Reading System compliant with the DAISY Online Delivery protocol as approved by the DAISY Consortium.

**Properties**

***Content model:*** ( [**manufacturer**](#_manufacturer), [**model**](#_model)?, [**publicKey**](#ELE_publicKey))

***Parent(s):*** [**readingSystemList**](#_6.12._The_readingSystemList)

### requiresAudioLabels

Specifies whether the Reading System requires audio labels for messages provided by the Service (i.e. whether the [**audio**](#_audio) child element of [**label**](#_label_1) is required).

Refer to the [**supportsAudioLabels**](#_supportsAudioLabels) element in [**serviceAttributes**](#_6.14._The_serviceAttributes) for the Service's declaration of support for audio in labels.

In the case where the Reading System requires audio labels and the Service does not support audio labels, the Reading System must decide whether to continue initializing the session. If a session is established in this scenario, then the Service is not required to include the [**audio**](#_audio) element in each [**label**](#_label_1) it provides.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**config**](#_config)

### resource

#### Properties

***Content model:*** empty element

***Parent(s):*** [**resources**](#_6.13._The_resources)

**Attributes**

**uri**

The URI of the resource.

***Use:*** required

***Data type:* xs:anyURI**

**mimeType**

The [[MIME]](#REF_MIMEPart2MediaTypes) type of the resource.

***Use:*** required

***Data type:* xs:string**

**size**

The size of the resource in bytes.

***Use:*** required

***Data type:* xs:long**

**localURI**

The local relative path of the resource.

The value of this attribute is a URI relative to the Content item's root directory.

***Use:*** required

***Data type:* xs:anyURI**

**lastModifiedDate**

The last modified time of the resource.

***Use:*** optional

***Data type:* xs:dateTime**

**packageURI**

The URI of a package in which the resource can be found.  
  
The value of this attribute refers to a URI,  
which the Reading System may choose to download instead of the uri attribute.  
  
The Service thus has the possibility to group one or more resources into one package, such as all text resources of an audio book.  
  
This value will be identical for all resources found in the same package.

***Use:*** optional

***Data type:* xs:anyURI**

**packageMimeType**

The [[MIME]](#REF_MIMEPart2MediaTypes) type of the package.

The value of this attribute indicates to the Reading System how to unpack the package.

***Use:*** optional

***Data type:* xs:string**

**packageSize**

The size of the package in bytes.

***Use:*** optional

***Data type:* xs:long**

### sample

A sample of the Content item that the User may retrieve without the Content item being added to their bookshelf.

#### Properties

***Content model:*** empty element

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata)

#### Attributes

**id**

The Content Identifier of the sample.

Reading Systems may retrieve the sample's resource list by calling [**getContentResources**](#_5.1.4._The_getContentResources) with this identifier as the parameter.

***Use:*** required

***Data type:* xs:string**

### serialNumber

The serial number of the Reading System, if such is available.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

### service

Contains the definition of a Service compliant with the DAISY Online Delivery protocol as approved by the DAISY Consortium.

**Properties**

***Content model:*** ([**name**](#ELE_name), [**url**](#ELE_url), [**website**](#ELE_website)?, [**phone**](#ELE_phone)?, [**email**](#ELE_email)?, [**country**](#ELE_country), [**languages**](#ELE_languages), [**latitude**](#ELE_latitude), [**longitude**](#_longitude))

***Parent(s):*** [**serviceList**](#_6.15._The_serviceList)

### serviceProvider

The identity of the Service Provider.

#### Properties

***Content model:*** ( [**label**](#_label_1)? )

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

#### Attributes

**id**

The identifier of the Service Provider.

This specification does not require a specific scheme to be used for this identifier. The identifier should not change while the Service provider remains active, and it should be universally unique.

A recommended expression form is a hyphen-separated string consisting of a country code from [[ISO 3166]](#REF_ISO31661CodesCountryCodes), followed by an agency code unique within its country. For example, us-afb.

***Use:*** required

***Data type:* xs:NMTOKEN**

### size

The total size of the resources making up the Content item, in bytes.

#### Properties

***Data type:* xs:long**

***Parent(s):*** [**metadata**](#_metadata)

### subCategoryLabel

The human readable, localized, label for the subCategory of a Content item.

#### Properties

***Content model:*** ( [**label**](#_label_1) )

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata)

### supportedContentFormats

Specifies which Content formats the Reading System supports. A Service may use this information to choose which formats to offer to the Reading System. This document does not specify the behavior of the Service if this list is empty.

#### Properties

***Content model:*** ( [**contentFormat**](#_contentFormat)\* )

***Parent(s):*** [**config**](#_config)

### supportedContentProtectionFormats

Specifies which Content protection (Digital Rights Management) standards the Reading System supports, if any.

#### Properties

***Content model:*** ( [**protectionFormat**](#_protectionFormat)\* )

***Parent(s):*** [**config**](#_config)

### supportsDownload

In [**contentMetadata**](#_6.5._The_contentMetadata), specifies whether the Content item is available for download from the Service. In [**serviceAttributes**](#_6.14._The_serviceAttributes), specifies whether the Service supports download. In [**config**](#_config), specifies whether the Reading System supports download.

At least one (or both) of supportsDownload and supportsStreaming must be set to true (see also [**supportsStreaming**](#_supportsStreaming)).

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata), [**serviceAttributes**](#_6.14._The_serviceAttributes), [**config**](#_config)

### supportedInputTypes

The means of User input to the Service that the Reading System supports.

If the Reading System does not support any means of input, the inputTypes element must be empty.

#### Properties

***Content model:*** ( [**input**](#_input)\* )

***Parent(s):*** [**config**](#_config)

### supportedMimeTypes

Specifies which [[MIME]](#REF_MIMEPart2MediaTypes) types the Reading System supports.

This applies to both Content and Service messages ([**label**](#_label_1)s).

A Service may use this information to choose which resource types to offer to the Reading System as labels and Content. Content types for which support is implied by the Content formats in [**supportedContentFormats**](#_supportedContentFormats) need not be included here. This specification does not specify the behavior of the Service if both this and the **supportedContentFormats** lists are empty.

#### Properties

***Content model:*** ( [**mimeType**](#_mimeType)\* )

***Parent(s):*** [**config**](#_config)

### supportedOptionalOperations

Specifies which (if any) of the [optional](#_5.2._Optional_Operations) operations are supported by the Service.

#### Properties

***Content model:*** ( [**operation**](#_operation)\* )

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### supportedUplinkAudioCodecs

A list of the audio codecs (if any) supported in [**userResponses**](#_6.16._The_userResponses) in addition to [[RIFF WAVE]](#REF_RiffWave).

#### Properties

***Content model:*** ( [**codec**](#_codec)\* )

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### supportsAudioLabels

Specifies whether this Service supports the inclusion of audio in [**label**](#_label_1)**s**.

If the value of this element is true and the [**requiresAudioLabels**](#_requiresAudioLabels) element of [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes) is true, then the Service must include the [**audio**](#_audio) element in each [**label**](#_label_1) it provides.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### supportsMultipleSelections

Specifies whether the Reading System supports multiple selections for a [**multipleChoiceQuestion**](#_multipleChoiceQuestion).

If this element is set to false, the Service must not present a [**multipleChoiceQuestion**](#_multipleChoiceQuestion) with its allowMultipleSelections attribute set to true to the Reading System.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**config**](#_config)

### supportsResourcePackages

Specifies whether the Reading System supports resource packages.

If this element is set to true, the Service may present packageURI, packageMimeType and packageSize for [**resource**](#_resource)s.

Setting this element to true should be combined with specifying one **contentFormat** with the value application/zip among the supportedContentFormats, if the supportedContentFormats is non empty.

When this element is set to true, the Service may also choose to present one single zip resource, in which case neither packageURI, packageMimeType nor packageSize will be included in the **resource**.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**config**](#_config)

### supportsRestrictedDownload

In [**contentMetadata**](#_6.5._The_contentMetadata), specifies whether the Content item is available for restricted download from the Service. In [**serviceAttributes**](#_6.14._The_serviceAttributes), specifies whether the Service supports restricted download. In [**config**](#_config), specifies whether the Reading System supports restricted download.

supportsRestrictedDownload must not be false if supportsDownload is false.

#### Properties

***Data type:* xs:Boolean**

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata), [**serviceAttributes**](#_6.14._The_serviceAttributes), [**config**](#_config)

### supportsSearch

Specifies whether [**getQuestions**](#_5.2.13._The_getQuestions) with the reserved parameter search is supported by the Service.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### supportsServerSideBack

Specifies whether [**getQuestions**](#_5.2.13._The_getQuestions) with the reserved parameter back is supported by the Service.

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**serviceAttributes**](#_6.14._The_serviceAttributes)

### supportsStreaming

In **contentMetadata**, specifies whether the Content item is available for streaming from the Service. In [**serviceAttributes**](#_6.14._The_serviceAttributes), specifies whether the Service supports streaming. In [**config**](#_config), specifies whether the Reading System supports streaming.

At least one (or both) of supportsDownload and supportsStreaming must be set to true (see also [**supportsDownload**](#_supportsDownload)).

#### Properties

***Data type:* xs:boolean**

***Parent(s):*** [**contentMetadata**](#_6.5._The_contentMetadata), [**serviceAttributes**](#_6.14._The_serviceAttributes), [**config**](#_config)

### text

The text component of the [**label**](#_label_1).

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**label**](#_label_1)

### url

The URL of the Service Provider’s DAISY Online service.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#ELE_service)

### username

A valid username for the given Service that can be used for subsequent Reading System authentication against a compliant Service Provider.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**credentials**](#_6.6._The_credentials)

### userResponse

A response to a question. Either the value attribute (for **inputQuestion** or **multipleChoiceQuestion** responses) or the data element (for audio-based responses) must be present, unless the questionID attribute's value is one of the reserved identifiers given below.

If a **userResponses** element is a response to a [**multipleChoiceQuestion**](#_multipleChoiceQuestion) where multiple selections are allowed, then multiple **userResponse** elements must be used to represent each selection (where each **userResponse** refers to the same question via the questionID attribute).

#### Properties

***Content model:*** ( [**data**](#_data)? )

***Parent(s):*** [**userResponses**](#_6.16._The_userResponses)

#### Attributes

**questionID**

The identifier of the question being answered.

The following three values of this attribute are reserved for use as defined below:

* default

The root question (main menu) from the Service. (This value is used to initiate a dynamic menu operation sequence, and does not reflect an answered question.)

A Service that supports Dynamic Menus must support this reserved identifier.

* search

The Service's search menu.

A Service is not required to support the search reserved identifier. A Service must explicitly declare whether it supports this identifier in [**serviceAttributes**](#_6.14._The_serviceAttributes).

* back

The previous question from the Service during a dynamic menu operation sequence.

A Service is not required to support the back reserved identifier. A Service must explicitly declare whether it supports this identifier in [**serviceAttributes**](#_6.14._The_serviceAttributes).

***Use:*** required

***Data type:* xs:NMTOKEN**

**value**

In the case of an **inputQuestion**, this attribute contains the textual response. In the case of a **multipleChoiceQuestion**, it contains the ID of the choice.

***Use:*** optional

***Data type:* xs:string**

### version

The version of the Reading System.

#### Properties

***Data type:* xs:string**

***Parent(s):*** [**readingSystemAttributes**](#_6.11._The_readingSystemAttributes)

### website

A valid website address that points to the Service Provider’s web site.

**Properties**

***Data type:* xs:string**

***Parent(s):*** [**service**](#ELE_service)

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# Appendix A. WSDL Abstract Definition

**This appendix is normative**

The [[WSDL 1.1]](#REF_WSDL11) entities defined in the accompanying [do-wsdl-10.wsdl](file:///C:\Temp\do-spec-20100402\do-wsdl-10.wsdl) document constitute the abstract Web Service contract that all compliant Services must adhere to.

The Service Provider must publish a WSDL document at some URI. The WSDL document must import http://www.daisy.org/projects/daisy-online-delivery/do-wsdl-10.wsdl into the namespace http://www.daisy.org/ns/daisy-online/. It must define a service with one port bound to DaisyOnlineService in the http://www.daisy.org/ns/daisy-online/ namespace.

**Example A.1. An example published WSDL document**

<?xml version="1.0" encoding="utf-8"?>

<definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"

xmlns:tns="http://www.daisy.org/ns/daisy-online/"

xmlns="http://schemas.xmlsoap.org/wsdl/"

targetNamespace="http://www.daisy.org/ns/daisy-online/">

<import namespace="http://www.daisy.org/ns/daisy-online/"

location="http://www.daisy.org/projects/daisy-online-delivery/do-wsdl-10.wsdl"/>

<service name="example">

<documentation>

Example DAISY Online Service

</documentation>

<port name="examplePort" binding="tns:DaisyOnlineService">

<soap:address location="http://example.org/daisy-online/"/>

</port>

</service>

</definitions>

# Appendix B. Acknowledgments

**This appendix is informative**

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* Markus Gylling, DAISY Consortium (co-chair)
* Kenny Johar, Vision Australia (co-chair)

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* Greg Kearney, Individual Supporter
* George Kerscher, DAISY
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