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Shapeways Model Upload Interface

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1 Interface

The Shapeways model upload interface has the following specifications:

- SOAP over HTTP
- Public available on www.shapeways.com

1.1 Functionalities

The Shapeways interface enables to:

- download the available material definitions including their properties,
- get a price for a model for printing
- upload a model

1.1.1 Material options

With the material options, the interface offers a way to retrieve an overview of the materials that Shapeways can print in, with their properties such as minimum and maximum allowed sizes, name and description.

1.1.2 Price check

The price check offers a way to ask Shapeways the price for a model if that model would be ordered via Shapeways. The pricing model of Shapeways depends on the model volume and the requested material.

1.1.3 Upload model

By uploading a model, the model is place directly into the 'my designs' gallery of the user, without the need to use a web browser for uploading. Before uploading a user has to identify themselves to assign the uploaded model to this user.

1.2 Change log

Date	Version	Change
2009-11-23	1.0.8	First release of document
2009-12-11	1.0.9	Addition of property scale to data type SWModel and some textual changes
2010-10-28	1.0.10	Added documentation for feature to set markup via api (field markup in SWModel datatype)

2 Methods and datatypes

This chapter describes the methods and the used datatypes.

2.1 Login

The login call enables users to authenticate themselves to Shapeways. The model upload call requires the resulting session id. Other calls can optionally use the session id to get for example personalised VAT and shipping cost.

```
public function login($username, $password, $application_id = null)
```

Type	Name	Description	Length	Obligatory
String	username	Username of the user. Username is the username a user uses to login on the portal.	50	Y
String	password	Password of the user. The password is the password that is used to login on the portal	100	Y
String	application_id	Id depending on the application used, is free to choose.	100	N
Returns				
String	session_id	Id for the login session when login is successful	32	

2.2 getPrinters

The getPrinters call is used to retrieve the available materials that Shapeways offers. The materials are grouped per printer.

```
public function getPrinters($session_id, $templateId = null, $application_id=null)
```

Type	Name	Description	Length	Obligatory
String	session_id	The sessionid returned when calling login	32	N
String	application_id	Unique Id of the application using the interface. Free to choose by developers.	100	N
Integer	templateId	Only applicable for Shapeways template models (in case instructed by Shapeways staff). In all other cases do not use this variable.	11	N
Returns				
PrinterArray	printerArray	Array with printers with their materials.		

2.2.1 Data types

2.2.1.1 PrinterArray

PrinterArray			
Title	**Type**	**length**	**Unit**
title	String	50	
volume	Float	20,4	cm3
wallthickness	Float	20,4	cm
technology	String	255	
x_bound_min	Float	20,4	cm
x_bound_max	Float	20,4	cm
y_bound_min	Float	20,4	cm

y_bound_max	Float	20,4	cm
z_bound_min	Float	20,4	cm
z_bound_max	Float	20,4	cm
materials	MaterialArray	n/a	

2.2.1.2 MaterialArray

MaterialArray			
Title	**Type**	**length**	
id	Integer	11	
title	String	50	
description	String	1024	
base_color	String	255	color definition for display / preview purposes
specular_color	String	255	
shininess	Integer	10	
opacity	Float	20,4	
translucency	Float	20,4	
refractive_index	Float	20,4	

2.3 getModelPrice

If a session_id is given the function will return the price inclusive VAT and shipping cost. If the session_id is not given the model price exclusive VAT and shipping cost is returned, this means after upload the price can be different if the user does need to pay vat.

public function getModelPrice ($session_id, $model_volume, $material_id, $template_id = null, $application_id = null)

Type	**Name**	**Description**	**Length**	**Obligatory**
String	session_id	The sessionid returned when calling login	32	N
String	application_id	Unique Id of the application using the interface. Free to choose by developers.	100	N
Float	modelVolume	The volume of the model	20,4	Y
Integer	materialId	The id of the material we use the costs per cc from	11	Y
Integer	templateId	If we have a template we can have different calculations	11	N
Returns				
SWModelPrice	modelprice	The requested price for the model		

2.3.1 Data types

2.3.1.1 SWModelPrice

SWModelPrice			
Title	**Type**	**Length/values**	**Unit**
price	Float	20,4	price per cm3
includes_tax	Boolean	true/false	
includes_shipping	Boolean	true/false	

currency	String	10 (USD/EUR)	

Note: at this moment Shapeways all Shapeways prices are in Dollars.

2.4 submitModel

This is the call where the model will be uploaded. Shapeways needs to know for whom the uploaded model is, hence a session_id is obligated here. When calling login successfully a session_id is returned.

public function submitModel($session_id, SWModel $model, $templateId = null, $application_id)

Type	Name	Description	Length	Obligated
String	session_id	The session_id returned when calling login	32	Y
String	application_id	Unique Id of the application using the interface. Free to choose by developers.	100	N
SWModel	model	The model to upload (including the file)	n/a	Y
Integer	templateId	If we have a template we can have different calculations	11	N
Returns				
String	State	Will answer successful or failed about upload		

2.4.1 Data types

2.4.1.1 SWModel

SWModel			
Title	**Type**	**Length/values**	**remark**
title	String	50	
desc	String	1024	
modeltype	Enumeration	VRML, STL, X3D, X3DB, X3DV, DAE, ZIP	Obligatory. For some templates, x3d is obligated.
view_state	Integer	0 - Only viewable 1 – Viewable and orderable	Is the model only a showcase, or should it also be orderable for printing. Default 1 (can be ordered)
file	Base64Binary		Obligatory, the model itself
file_uri	String	255	
filename	String	100	
tags	String	Comma delimited string	Descriptive tags for the model
has_color	Boolean	true/false	
scale	Float	20,4	Scale compared to meters (0.001 for mm 0.001 for cm 0.0254 for inch). Obligatory for stl files as that format has no unit in the format. Ignored for other files.
markup	Float	20,4	Markup in dollars. Use this field to immediately set the markup for this model on upload.

Note: Shapeways wants to introduce color materials. To support color, the modeltype 'ZIP' and field 'hascolor' are already listed in this specification. However, they can only be used when color is offered by Shapeways.

3 API

3.1 Location

The WSDL for the web services can be found at
http://api.shapeways.com/v1/wsdl.php

3.2 Process example

An example in what order the methods can be used to upload a model

- To be able to display a list of materials the getPrinters can be called. This will return an array of printers, each printer can contain an array of one or more materials.
- When a list of materials is returned and a model is created the price of the model can be requested with the getModelPrice call. This will require the volume of the model and the chosen material. As reply an array is returned that contains data like the price and currency.
- Before a model can be submitted the user needs to login into Shapeways. For this the call login is to be used. Login expects the same username and password that the user uses to login into the portal. This call will return a session id that is needed to use with the submit model call.
- When user determines the model is ready for upload, the model can be submitted by using the 'submitModel' call. For this a session_id is need which can be obtained by the 'login' call.

To directly upload a model, login and submitModel is sufficient.

3.3 Application identifier

The program identifier is to let Shapeways know what external software was used to upload the model. The id can be chosen freely but should be less than 100 characters. Implementations of the interface should use the name of their application here.

3.4 Terms and conditions

To make sure a user accepts to the terms and conditions of Shapeways a model that us uploaded using the interface is set to private by the interface. Before the user can use the model on the Shapeways portal, one must agree to the terms and conditions.