ARE RESTful API

Table of Contents

RESTful API

To allow remote communication with the AsTeRICS Runtime Environment, the ARE RESTful API was developed. It allows manipulation of resources through a set of HTTP methods such as GET, POST, PUT and DELETE.

Apart from the regular RESTful functions, an event mechanism is provided. With this mechanism, ARE can broadcast messages to anyone who subscribes and inform when an event occurs.

The API uses HTTP status codes to declare an error in a call. Specifically, when an error occurs, the response will contain a 500 HTTP status code (Internal Server Error) with an ARE-produced error message inside the HTTP response body.

The figure in the next page describes these methods and provides the necessary information in order to call them.

RESTful API Functions

HTTP Method	Resource	Parameters	Consumes	Produces	Description
GET	/runtime/model	-	-	XML	Returns the currently deployed model in XML
PUT	/runtime/model	modelInXML (in body)	XML	TEXT	Deploys the model given as a parameter
PUT	/runtime/model/{filename}	filename	-	TEXT	Deploys the model contained in the given filename
PUT	/runtime/model/state/{state}	state	-	TEXT	Changes the state of the deployed model to STARTED, PAUSED, STOPPED
GET	/runtime/model/state	-	-	TEXT	Returns the state of the deployed model
PUT	/runtime/model/autorun/ {filename}	filename	-	TEXT	Deploys and starts the model in the given filename
GET	/runtime/model/components	-	-	JSON	Returns all the components contained in the currently deployed model
GET	/runtime/model/components/ {componentId}	componentId	-	JSON	Returns all property keys of the component with the given componentId in the currently deployed model
GET	/runtime/model/components/ {componentId}/{componentKey}	componentId, componentKey	-	TEXT	Returns property value of a specific component, in the currently deployed model
PUT	/runtime/model/components/ {componentId}/{componentKey}	componentId, componentKey, value (in body)	TEXT	TEXT	Changes a property value of a specific component, in the currently deployed model
GET	/storage/models/{filename}	filename	-	XML	Returns an xml representation of a model in a specific file
POST	/storage/models/{filename}	filename, modelInXML (in body)	XML	TEXT	Stores a model in the given filename
DELETE	/storage/models/{filename}	filename	-	TEXT	Deletes the model with the given filename
GET	/storage/models	-	-	JSON	Returns a list with all the models that are saved in the ARE repository
GET	/storage/components/collection	-	-	XML	Returns an xml string containing the descriptors of the created components
GET	/storage/components	-	-	JSON	Returns a list with all the component descriptors contained in the ARE

					repository
GET	/restfunctions	-	-	JSON	Returns a list with all the available rest functions
GET	/events/subscribe	-	-	-	Opens a persistent connection with ARE to use it for Server Sent Events.

RESTful API libraries

To provide easier RESTful API accessibility, communication libraries were created that simplify the whole procedure.

The JavaScript library

To install the JavaScript library in a webpage you have to:

1) Import the 'ARECommunicator.js' file in your html page.
2) Import 'JSmap.js' file in your html page.
3) Import a script that provides jQuery functionality.

Before you start calling ARE functions, you have to set the baseURI which is the URI where ARE runs at:

```
setBaseURI("http://localhost:8081/rest/");
```

To call any REST function, you have to provide two callback functions: a successCallback and an errorCallback such as the example below

```
//downloadDeployedModel
function DDM() {
    downloadDeployedModel(DDM_successCallback, DDM_errorCallback);
}

function DDM_successCallback(data, HTTPstatus) {
    alert(data);
}

function DDM_errorCallback(HTTPstatus, AREerrorMessage) {
    alert(AREerrorMessage);
}
```

Furthermore, the 'subscribe' function is opening a persistent connection with ARE. Using an event mechanism based on Server Sent Events (SSE) technology, it listens to the connection for broadcasted messages. Additionally, the eventType name must be provided, to specify what type of events to listen for. The concept still remains the same as you must provide a successCallback and an errorCallback function. The unsubscribe function do not use any rest calls since it closes the connection from the browser's side.

In below you can find an array describing each method contained in the library and a listing with the available event types.

JavaScript Library Functions

Function Signature	Description
downloadDeployedModel(**sCB1**, eCB)	Retrieves the currently deployed model in XML
uploadModel(**sCB1**, eCB, modelinXML)	Deploys the model given as a parameter
deployModelFromFile(**sCB1**, eCB, filename)	Deploys the model contained in the given filename
startModel(**sCB1**, eCB) stopModel(**sCB1**, eCB) pauseMolel(**sCB1**, eCB)	Changes the state of the deployed model to STARTED, PAUSED, STOPPED
getModelState(**sCB1**, eCB)	Retrieves the state of the deployed model
autorun(**CB1**, eCB, filename)	Deploys and starts the model in the given filename
getRuntimeComponentIds(**sCB1**, eCB)	Retrieves all the component Ids contained in the currently deployed model (as JSON array)
getRuntimeComponentPropertyKeys(**sCB2**, eCB, componentId)	Retrieves all property keys of the component with the given componentId in the currently deployed model (as JSON array)
getRuntimeComponentProperty(**sCB1**, eCB, componentId, componentKey)	Retrieves property value of a specific component, in the currently deployed model
setRuntimeComponentProperty(**sCB1**, eCB, componentId, componentKey, value)	Changes a property value of a specific component, in the currently deployed model
downloadModelFromFile(**sCB1**, eCB, filename)	Retrieves an xml representation of a model in a specific file
storeModel(**sCB1**, eCB, filename, modelinXML)	Stores a model in the given filename
deleteModelFromFile(**sCB1**, eCB, filename)	Deletes the model with the given filename
listStoredModels(**sCB2**, eCB)	Retrieves the models that are saved in the ARE repository (as JSON array)
getComponentDescriptorsAsXml(**sCB2**, eCB)	Returns an xml string containing the descriptors of the created components with some modifications in order to be used by the webACS
getComponentDescriptorsAsJSON(**sCB2**, eCB)	Retrieves the exact content of the component descriptors contained in the ARE repository (as JSON array)
getRestFunctions(**sCB2**, eCB) ***	Retrieves the information for all the available rest functions provided by the Restful API (as JSON array with Function objects)
subscribe(**sCB1**, eCB, eventType)	Opens a persistent connection with ARE and listens for Server Sent Events.
unsubscribe(eventType)	Closes the connection for Server Sent Events. Returns true if the unsubscription was successful and false otherwise

sCB1: successCallback(textData, HTTPstatus)

sCB2: successCallback(array, HTTPstatus)

eCB: errorCallback(HTTPstatus, AREerrorMessage)

**: Component object (see JSON objects section)

***: Function object (see JSON objects section)

Event Type Name	Description
Model State Changed	Notifies the subscribers that model state was changed (started, stopped, paused)
Model changed	Notifies the subscribers that model was changed
Repository changed *	Notifies the subscribers the ARE repository content was changed

Event Types

* NOT YET IMPLEMENTED

Object Name	Example

JSON OBJECTS

Function	{
	"path": "/runtime/model",
	"description": "Retrieves the currently deployed model in XML",
	"httpRequestType": "GET",
	"bodyParameter": "",
	"consumes": "",
	"produces": "text/xml"
	}

Component	{
	"canonicalName":"eu.asterics.component.processor….",
	"type":"PROCESSOR",
	"id":"asterics.StringDispatcher",
	"description":"Send text from chosen slot",
	"singleton":false,
	"inputPorts":[
	{
	"type":"INPUT",
	"multiplicity":null,
	"description":"Send the string from the slot defined by the incoming value",
	"portID":"slotDispatch",
	"dataType":"INTEGER",
	"propertyNames":null
	}
	],
	"outputPorts":[
	{
	"type":"OUTPUT",
	"description":"Output text",
	"portID":"output",
	"dataType":"STRING",
	"propertyNames":null
	}
	],
	"eventTriggererPorts":[
	
	],
	"ports":[
	{
	"type":"INPUT",
	"multiplicity":null,
	"description":"Send the string from the slot defined by the incoming value",
	"portID":"slotDispatch",
	"dataType":"INTEGER",
	"propertyNames":null
	},
	{
	"type":"OUTPUT",
	"description":"Output text",
	"portID":"output",
	"dataType":"STRING",

	<pre>"propertyNames":null
	}
	],
	"eventPorts":[
	{
	"id":"dispatchSlot1",
	"description":"Send text from slot 1"
	}
	],
	"eventListenerPorts":[
	{
	"id":"dispatchSlot1",
	"description":"Send text from slot 1"
	}
	],
	"propertyNames":[
	"delay",
	"slot1"
	]
	}</pre>

The Java library

To use the JAVA framework in your code, you have to import the 'ARECommunicator.jar' file. When you do this, the procedure of communicating with ARE is reduced in plain calls of Java methods of an object.

As with JavaScript framework, you must first set the baseURI:

```
ARECommunicator areCommunicator = new ARECommunicator("http://localhost:8081/rest/");
```

when this is done, you can call any method:

```
areCommunicator.startModel();
```

In the next page you can find an array that describes each method that is contained in the library.

Java Library Methods

Function Signature	Description
String downloadDeployedModel()	Retrieves the currently deployed model in XML
String uploadModel(**String** modelinXML)	Deploys the model given as a parameter
String deployModelFromFile(**String** filename)	Deploys the model contained in the given filename
String startModel() **String** stopModel() **String** pauseModel()	Changes the state of the deployed model to STARTED, PAUSED, STOPPED
String getModelState()	Retrieves the state of the deployed model
String autorun(**String** filename)	Deploys and starts the model in the given filename
String[] downloadComponentCollection()	Retrieves all the components contained in the currently deployed model
String[] getComponentPropertyKeys(**String** componentId)	Retrieves all property keys of the component with the given componentId in the currently deployed model
String getComponentProperty(**String** componentId, **String** componentKey)	Retrieves property value of a specific component, in the currently deployed model
String setComponentProperty(**String** componentId, **String** componentKey, **String** value)	Changes a property value of a specific component, in the currently deployed model
String downloadModelFromFile(**String** filename)	Retrieves an xml representation of a model in a specific file
String storeModel(**String** filename**, String** modelinXML)	Stores a model in the given filename
String deleteModelFromFile(**String** filename)	Deletes the model with the given filename
String[] listStoredModels()	Retrieves a list with all the model that are saved in the ARE repository
String[] getInstalledComponents() *	Returns a list containing all the available ARE components
String getInstalledComponentsDescriptor() *	
String getCreatedComponentsDescriptor() *	
ArrayList<RestFunction> functions()	Retrieves a list with all the available rest functions
subscribe(**String** eventType) *	Subscribes the IP that sent the request to the event mechanism
unsubscribe(**String** eventType) *	Unsubscribes the IP that sent the request to the event mechanism

* NOT YET IMPLEMENTED