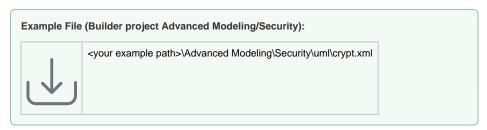
Crypto Adapter

With crypto components, it is possible to generate private/public key pairs to create and validate signatures with the RSA encryption algorithm.



All these can be done in an action node with the stereotype <<Crypto>> and its specific actions. You can

- create a key pair
- · create a signature
- validate a signature against a key
- create a hash value of a given data blob

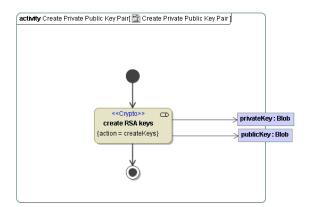
As this is a static adapter which cannot be configured in any way, the names of the input and output object flow states must be exactly named like described below.

Creating a Key Pair

The first step is to create a private/public key pair.

- You can use a key pair in format PKCS#8 (generated e.g. by OpenSSL). In this case, you do
 not need to generate a key pair with the Bridge and you can proceed with the next steps.
- You can use the Bridge to generate a private/public key pair in format PKCS#1. This can be
 done via the action createKeys. The adapter does not need any input but creates two Blob obje
 cts named privateKey and publicKey.

The following figure shows the necessary activity diagram to create the private and public keys in format **PKCS#1**.



With this pair of keys it is possible to identify the sender of any data.

Creating a Signature

A signature can be generated by using the action **createSignature**. This action node expects three parameters of base type **Blob**:

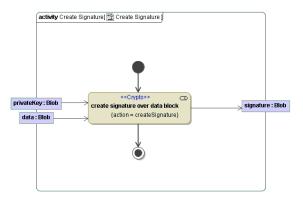
- privateKey
- data
- signature

The signed data must be a **Blob**. So if you want to furnish a **String**, **Integer** or other base types with a signature, you have first to convert it to a **Blob** using the convert operation (see <u>String Operations</u>). You do not have to specify the key format. The Runtime will try to read the private key as **PKCS#8**. If this fails, the Runtime will re-try to read the private key as PKCS#1.

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- Creating a Key Pair
- Creating a Signature
- Validating a Signature
- Hashing Data

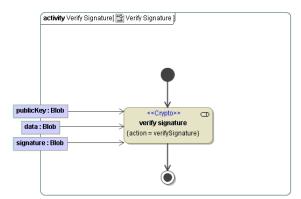
The following action node adds the **privateKey** to the data object and creates the object **signature** containing the data.



Validating a Signature

To check if the created signature is valid, you can use action **verifySignature**. This action takes a signature, the corresponding public key and data blob and returns an error message like "Verifying signature failed.", if one parameter is not valid or does not correspond to the others. You do not have to specify the key format. The Runtime will try to read the public key as PKCS#8. If this fails, the Runtime will re-try to read the public key as PKCS#1.

The following figure shows how to verify a signature:



Hashing Data

Sometimes it is desirable to get a hash value of a given blob. This is done using an action node having the stereotype <<Crypto>> and the action **createHash**.

Builder 7.12.0 The **Crypto** adapter uses the hash algorithm specified with parameter **algorithm**, or the **di gestAlgorithm** specified on the <<**Crypto>>** action node if no parameter has been supplied. If no algorithm is supplied at all, the adapter uses default algorithm **sha1**. Refer to the **Crypto** Adapter Reference for more details.

The following figure shows how to create a hash with the default algorithm:

