| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/KeyFactory.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV CLASS**](http://docs.google.com/java/security/KeyException.html)   [**NEXT CLASS**](http://docs.google.com/java/security/KeyFactorySpi.html) | [**FRAMES**](http://docs.google.com/index.html?java/security/KeyFactory.html)    [**NO FRAMES**](http://docs.google.com/KeyFactory.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | FIELD | [CONSTR](#3znysh7) | [METHOD](#2et92p0) | DETAIL: FIELD | [CONSTR](#3dy6vkm) | [METHOD](#4d34og8) |

## **java.security**

Class KeyFactory

[java.lang.Object](http://docs.google.com/java/lang/Object.html)  
 **java.security.KeyFactory**

public class **KeyFactory**extends [Object](http://docs.google.com/java/lang/Object.html)

Key factories are used to convert *keys* (opaque cryptographic keys of type Key) into *key specifications* (transparent representations of the underlying key material), and vice versa.

Key factories are bi-directional. That is, they allow you to build an opaque key object from a given key specification (key material), or to retrieve the underlying key material of a key object in a suitable format.

Multiple compatible key specifications may exist for the same key. For example, a DSA public key may be specified using DSAPublicKeySpec or X509EncodedKeySpec. A key factory can be used to translate between compatible key specifications.

The following is an example of how to use a key factory in order to instantiate a DSA public key from its encoding. Assume Alice has received a digital signature from Bob. Bob also sent her his public key (in encoded format) to verify his signature. Alice then performs the following actions:

X509EncodedKeySpec bobPubKeySpec = new X509EncodedKeySpec(bobEncodedPubKey);  
 KeyFactory keyFactory = KeyFactory.getInstance("DSA");  
 PublicKey bobPubKey = keyFactory.generatePublic(bobPubKeySpec);  
 Signature sig = Signature.getInstance("DSA");  
 sig.initVerify(bobPubKey);  
 sig.update(data);  
 sig.verify(signature);

**Since:** 1.2 **See Also:**[Key](http://docs.google.com/java/security/Key.html), [PublicKey](http://docs.google.com/java/security/PublicKey.html), [PrivateKey](http://docs.google.com/java/security/PrivateKey.html), [KeySpec](http://docs.google.com/java/security/spec/KeySpec.html), [DSAPublicKeySpec](http://docs.google.com/java/security/spec/DSAPublicKeySpec.html), [X509EncodedKeySpec](http://docs.google.com/java/security/spec/X509EncodedKeySpec.html)

| **Constructor Summary** | |
| --- | --- |
| protected | [**KeyFactory**](http://docs.google.com/java/security/KeyFactory.html#KeyFactory(java.security.KeyFactorySpi,%20java.security.Provider,%20java.lang.String))([KeyFactorySpi](http://docs.google.com/java/security/KeyFactorySpi.html) keyFacSpi, [Provider](http://docs.google.com/java/security/Provider.html) provider, [String](http://docs.google.com/java/lang/String.html) algorithm)            Creates a KeyFactory object. |

| **Method Summary** | |
| --- | --- |
| [PrivateKey](http://docs.google.com/java/security/PrivateKey.html) | [**generatePrivate**](http://docs.google.com/java/security/KeyFactory.html#generatePrivate(java.security.spec.KeySpec))([KeySpec](http://docs.google.com/java/security/spec/KeySpec.html) keySpec)            Generates a private key object from the provided key specification (key material). |
| [PublicKey](http://docs.google.com/java/security/PublicKey.html) | [**generatePublic**](http://docs.google.com/java/security/KeyFactory.html#generatePublic(java.security.spec.KeySpec))([KeySpec](http://docs.google.com/java/security/spec/KeySpec.html) keySpec)            Generates a public key object from the provided key specification (key material). |
| [String](http://docs.google.com/java/lang/String.html) | [**getAlgorithm**](http://docs.google.com/java/security/KeyFactory.html#getAlgorithm())()            Gets the name of the algorithm associated with this KeyFactory. |
| static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) | [**getInstance**](http://docs.google.com/java/security/KeyFactory.html#getInstance(java.lang.String))([String](http://docs.google.com/java/lang/String.html) algorithm)            Returns a KeyFactory object that converts public/private keys of the specified algorithm. |
| static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) | [**getInstance**](http://docs.google.com/java/security/KeyFactory.html#getInstance(java.lang.String,%20java.security.Provider))([String](http://docs.google.com/java/lang/String.html) algorithm, [Provider](http://docs.google.com/java/security/Provider.html) provider)            Returns a KeyFactory object that converts public/private keys of the specified algorithm. |
| static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) | [**getInstance**](http://docs.google.com/java/security/KeyFactory.html#getInstance(java.lang.String,%20java.lang.String))([String](http://docs.google.com/java/lang/String.html) algorithm, [String](http://docs.google.com/java/lang/String.html) provider)            Returns a KeyFactory object that converts public/private keys of the specified algorithm. |
| | <T extends [KeySpec](http://docs.google.com/java/security/spec/KeySpec.html)>  T | | --- | | [**getKeySpec**](http://docs.google.com/java/security/KeyFactory.html#getKeySpec(java.security.Key,%20java.lang.Class))([Key](http://docs.google.com/java/security/Key.html) key, [Class](http://docs.google.com/java/lang/Class.html)<T> keySpec)            Returns a specification (key material) of the given key object. |
| [Provider](http://docs.google.com/java/security/Provider.html) | [**getProvider**](http://docs.google.com/java/security/KeyFactory.html#getProvider())()            Returns the provider of this key factory object. |
| [Key](http://docs.google.com/java/security/Key.html) | [**translateKey**](http://docs.google.com/java/security/KeyFactory.html#translateKey(java.security.Key))([Key](http://docs.google.com/java/security/Key.html) key)            Translates a key object, whose provider may be unknown or potentially untrusted, into a corresponding key object of this key factory. |

| **Methods inherited from class java.lang.**[**Object**](http://docs.google.com/java/lang/Object.html) |
| --- |
| [clone](http://docs.google.com/java/lang/Object.html#clone()), [equals](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)), [finalize](http://docs.google.com/java/lang/Object.html#finalize()), [getClass](http://docs.google.com/java/lang/Object.html#getClass()), [hashCode](http://docs.google.com/java/lang/Object.html#hashCode()), [notify](http://docs.google.com/java/lang/Object.html#notify()), [notifyAll](http://docs.google.com/java/lang/Object.html#notifyAll()), [toString](http://docs.google.com/java/lang/Object.html#toString()), [wait](http://docs.google.com/java/lang/Object.html#wait()), [wait](http://docs.google.com/java/lang/Object.html#wait(long)), [wait](http://docs.google.com/java/lang/Object.html#wait(long,%20int)) |

| **Constructor Detail** |
| --- |

### KeyFactory

protected **KeyFactory**([KeyFactorySpi](http://docs.google.com/java/security/KeyFactorySpi.html) keyFacSpi,  
 [Provider](http://docs.google.com/java/security/Provider.html) provider,  
 [String](http://docs.google.com/java/lang/String.html) algorithm)

Creates a KeyFactory object.

**Parameters:**keyFacSpi - the delegateprovider - the provideralgorithm - the name of the algorithm to associate with this KeyFactory

| **Method Detail** |
| --- |

### getInstance

public static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) **getInstance**([String](http://docs.google.com/java/lang/String.html) algorithm)  
 throws [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html)

Returns a KeyFactory object that converts public/private keys of the specified algorithm.

This method traverses the list of registered security Providers, starting with the most preferred Provider. A new KeyFactory object encapsulating the KeyFactorySpi implementation from the first Provider that supports the specified algorithm is returned.

Note that the list of registered providers may be retrieved via the [Security.getProviders()](http://docs.google.com/java/security/Security.html#getProviders()) method.

**Parameters:**algorithm - the name of the requested key algorithm. See Appendix A in the  [Java Cryptography Architecture API Specification & Reference](http://docs.google.com/technotes/guides/security/crypto/CryptoSpec.html#AppA)  for information about standard algorithm names. **Returns:**the new KeyFactory object. **Throws:** [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html) - if no Provider supports a KeyFactorySpi implementation for the specified algorithm.**See Also:**[Provider](http://docs.google.com/java/security/Provider.html)

### getInstance

public static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) **getInstance**([String](http://docs.google.com/java/lang/String.html) algorithm,  
 [String](http://docs.google.com/java/lang/String.html) provider)  
 throws [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html),  
 [NoSuchProviderException](http://docs.google.com/java/security/NoSuchProviderException.html)

Returns a KeyFactory object that converts public/private keys of the specified algorithm.

A new KeyFactory object encapsulating the KeyFactorySpi implementation from the specified provider is returned. The specified provider must be registered in the security provider list.

Note that the list of registered providers may be retrieved via the [Security.getProviders()](http://docs.google.com/java/security/Security.html#getProviders()) method.

**Parameters:**algorithm - the name of the requested key algorithm. See Appendix A in the  [Java Cryptography Architecture API Specification & Reference](http://docs.google.com/technotes/guides/security/crypto/CryptoSpec.html#AppA)  for information about standard algorithm names.provider - the name of the provider. **Returns:**the new KeyFactory object. **Throws:** [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html) - if a KeyFactorySpi implementation for the specified algorithm is not available from the specified provider. [NoSuchProviderException](http://docs.google.com/java/security/NoSuchProviderException.html) - if the specified provider is not registered in the security provider list. [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if the provider name is null or empty.**See Also:**[Provider](http://docs.google.com/java/security/Provider.html)

### getInstance

public static [KeyFactory](http://docs.google.com/java/security/KeyFactory.html) **getInstance**([String](http://docs.google.com/java/lang/String.html) algorithm,  
 [Provider](http://docs.google.com/java/security/Provider.html) provider)  
 throws [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html)

Returns a KeyFactory object that converts public/private keys of the specified algorithm.

A new KeyFactory object encapsulating the KeyFactorySpi implementation from the specified Provider object is returned. Note that the specified Provider object does not have to be registered in the provider list.

**Parameters:**algorithm - the name of the requested key algorithm. See Appendix A in the  [Java Cryptography Architecture API Specification & Reference](http://docs.google.com/technotes/guides/security/crypto/CryptoSpec.html#AppA)  for information about standard algorithm names.provider - the provider. **Returns:**the new KeyFactory object. **Throws:** [NoSuchAlgorithmException](http://docs.google.com/java/security/NoSuchAlgorithmException.html) - if a KeyFactorySpi implementation for the specified algorithm is not available from the specified Provider object. [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if the specified provider is null.**Since:** 1.4 **See Also:**[Provider](http://docs.google.com/java/security/Provider.html)

### getProvider

public final [Provider](http://docs.google.com/java/security/Provider.html) **getProvider**()

Returns the provider of this key factory object.

**Returns:**the provider of this key factory object

### getAlgorithm

public final [String](http://docs.google.com/java/lang/String.html) **getAlgorithm**()

Gets the name of the algorithm associated with this KeyFactory.

**Returns:**the name of the algorithm associated with this KeyFactory

### generatePublic

public final [PublicKey](http://docs.google.com/java/security/PublicKey.html) **generatePublic**([KeySpec](http://docs.google.com/java/security/spec/KeySpec.html) keySpec)  
 throws [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html)

Generates a public key object from the provided key specification (key material).

**Parameters:**keySpec - the specification (key material) of the public key. **Returns:**the public key. **Throws:** [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html) - if the given key specification is inappropriate for this key factory to produce a public key.

### generatePrivate

public final [PrivateKey](http://docs.google.com/java/security/PrivateKey.html) **generatePrivate**([KeySpec](http://docs.google.com/java/security/spec/KeySpec.html) keySpec)  
 throws [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html)

Generates a private key object from the provided key specification (key material).

**Parameters:**keySpec - the specification (key material) of the private key. **Returns:**the private key. **Throws:** [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html) - if the given key specification is inappropriate for this key factory to produce a private key.

### getKeySpec

public final <T extends [KeySpec](http://docs.google.com/java/security/spec/KeySpec.html)> T **getKeySpec**([Key](http://docs.google.com/java/security/Key.html) key,  
 [Class](http://docs.google.com/java/lang/Class.html)<T> keySpec)  
 throws [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html)

Returns a specification (key material) of the given key object. keySpec identifies the specification class in which the key material should be returned. It could, for example, be DSAPublicKeySpec.class, to indicate that the key material should be returned in an instance of the DSAPublicKeySpec class.

**Parameters:**key - the key.keySpec - the specification class in which the key material should be returned. **Returns:**the underlying key specification (key material) in an instance of the requested specification class. **Throws:** [InvalidKeySpecException](http://docs.google.com/java/security/spec/InvalidKeySpecException.html) - if the requested key specification is inappropriate for the given key, or the given key cannot be processed (e.g., the given key has an unrecognized algorithm or format).

### translateKey

public final [Key](http://docs.google.com/java/security/Key.html) **translateKey**([Key](http://docs.google.com/java/security/Key.html) key)  
 throws [InvalidKeyException](http://docs.google.com/java/security/InvalidKeyException.html)

Translates a key object, whose provider may be unknown or potentially untrusted, into a corresponding key object of this key factory.

**Parameters:**key - the key whose provider is unknown or untrusted. **Returns:**the translated key. **Throws:** [InvalidKeyException](http://docs.google.com/java/security/InvalidKeyException.html) - if the given key cannot be processed by this key factory.

| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/KeyFactory.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV CLASS**](http://docs.google.com/java/security/KeyException.html)   [**NEXT CLASS**](http://docs.google.com/java/security/KeyFactorySpi.html) | [**FRAMES**](http://docs.google.com/index.html?java/security/KeyFactory.html)    [**NO FRAMES**](http://docs.google.com/KeyFactory.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | FIELD | [CONSTR](#3znysh7) | [METHOD](#2et92p0) | DETAIL: FIELD | [CONSTR](#3dy6vkm) | [METHOD](#4d34og8) |

[Submit a bug or feature](http://bugs.sun.com/services/bugreport/index.jsp)

For further API reference and developer documentation, see [Java SE Developer Documentation](http://docs.google.com/webnotes/devdocs-vs-specs.html). That documentation contains more detailed, developer-targeted descriptions, with conceptual overviews, definitions of terms, workarounds, and working code examples.

Copyright 2006 Sun Microsystems, Inc. All rights reserved. Use is subject to [license terms](http://docs.google.com/legal/license.html). Also see the [documentation redistribution policy](http://java.sun.com/docs/redist.html).