

# Haskell Cryptographic Library 4.2.0

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The Haskell Cryptographic Library 4.2.0<sup>1</sup> collects together existing Haskell cryptographic functions into one cabalized package, together with HUnit tests, QuickCheck property tests and examples. It is a significant change from previous versions and now only contains cryptographic functions; the functions for dealing with ASN.1, X.509 certificates and PKCS#8 will be provided by an entirely separate library reducing the number of dependencies.

This release contains:

- DES
- Blowfish
- AES
- TEA
- Cipher Block Chaining (CBC)
- PKCS#5 and nulls padding
- SHA-1
- MD5
- RSA

Haddock documentation for the library is available here<sup>2</sup>.

## 1 System Requirements

- The code has been tested on GHC 6.6 and Hugs Version September 2006. It does not currently work with YHC because of the lack of `Data.Word` and `Data.Bits`.
- It *no longer* requires the use of `NewBinary.Binary`.

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<sup>1</sup><http://www.haskell.org/crypto>

<sup>2</sup><http://www.haskell.org/crypto/doc/html>

## 2 Installation Instructions

Get the sources:

```
darcs get --tag "4.2.0" http://code.haskell.org/crypto
```

Build and install ready for testing:

```
ghc -o Setup Setup.hs -package Cabal
./Setup configure --prefix=/my/chosen/dir
./Setup build
./Setup install --user
```

Run the tests.

```
cd /my/chosen/dir/bin
./RSATest
./SymmetricTest
./QuickTest
```

You can now run the examples to confirm further that everything is working satisfactorily. When you are happy, build and install them in their final destination:

```
./Setup unregister --user
./Setup clean
./Setup configure
./Setup build
./Setup install
```

## 3 To Do

In no particular order:

- Incorporate other symmetric key algorithms already coded in Haskell.
- Performance analysis as Blowfish ought to run more quickly than DES.
- Other modes / padding schemes.
- Extend typechecking to ensure that only the appropriate key sizes are used for a given algorithm.
- Improve performance, for example, for SHA1. This code<sup>3</sup> runs an order of magnitude faster but, with respect to the authors, doesn't feel that functional.
- Get rid of the GPL code.

## 4 Contact

All questions, comments, bug reports, flames, requests for updates / changes and suggestions should be directed to Dominic Steinitz and logged here<sup>4</sup>.

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<sup>3</sup><http://www.abridgegame.org/repos/darcs-unstable>

<sup>4</sup><http://hackage.haskell.org/trac/crypto>

## 5 Licensing

The modules in the library come from different authors and have been released under different licences.

### 5.1 Contributors

#### 5.1.1 Codec.Binary

Codec.Binary.BubbleBabble	John Meacham	Copyright © 2008, All rights reserved	BSD
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#### 5.1.2 Codec.Text

Codec.Text.Raw	Dominic Steinitz	Copyright © 2006, All rights reserved	BSD
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#### 5.1.3 Codec.Encryption

Codec.Encryption.AES	Lukasz Anforowicz	Copyright © 2005, All rights reserved	BSD
Codec.Encryption.AESAux	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
Codec.Encryption.Blowfish	Doug Hoyte	Copyright © 2005, All rights reserved	BSD
Codec.Encryption.BlowfishAux	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
Codec.Encryption.TEA	John Meacham	Copyright © 2008, All rights reserved	BSD
Codec.Encryption.DES	Ian Lynagh	Copyright © 2005, All rights reserved	BSD
Codec.Encryption.DESAux	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
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Codec.Encryption.Padding	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
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#### 5.1.4 Codec

Codec.Utils	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
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### 5.1.5 Data.Digest

Data.Digest.MD5	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
Data.Digest.MD5Aux	Ian Lynagh	Copyright © 2005, All rights reserved	BSD
Data.Digest.SHA1	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD

### 5.1.6 Data

Data.LargeWord	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
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### 5.1.7 Tests and Examples

RSATest	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
QuickTest	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD
SymmetricTest	Dominic Steinitz	Copyright © 2005, All rights reserved	BSD

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## 6 Disclaimer

Cryptography is a notoriously easy area in which to make mistakes, not necessarily with the algorithms but with how they are implemented (for example not protecting keys, using weak keys and so on). For a readable account of some of the pitfalls, see Ross Anderson<sup>7</sup> 's book.

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- David Sankel<sup>9</sup>
- Ross Paterson<sup>10</sup>
- Lukasz Anforowicz
- Warrick Gray<sup>11</sup>

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<sup>6</sup><http://www.opensource.org/licenses/gpl-license.php>

<sup>7</sup><http://www.cl.cam.ac.uk/users/rja14/>

<sup>8</sup><http://web.comlab.ox.ac.uk/oucl/work/ian.lynagh>

<sup>9</sup><http://www.electronconsulting.com/whois.html>

<sup>10</sup><http://www.soi.city.ac.uk/~ross>

<sup>11</sup><http://homepages.paradise.net.nz/warrickg/haskell/http/>

- Russell O'Connor<sup>12</sup>
- Spencer Janssen

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<sup>12</sup><http://r6.ca>