

# RSA Key Pair Generation and Storage

For each agent created, the API generates an RSA key pair consisting of a public key and a private key. The key pair is generated using a modulus length of 4096 bits. The generated keys are stored in the MySQL database along with other agent information.

## Key Generation Process

When a new agent is created, the API performs the following steps to generate the RSA key pair:

1. Generates an RSA key pair using the `crypto.generateKeyPairSync` method with the following options:
  - Algorithm: RSA
  - Modulus Length: 4096 bits
  - Public Key Encoding: PKCS#1 format in PEM encoding
  - Private Key Encoding: PKCS#1 format in PEM encoding
2. The generated public key and private key are converted to string representations.
3. The public key string is stored in the `pubKey` field of the agent's record in the MySQL database.
4. The private key string is stored in the `privKey` field of the agent's record in the MySQL database.

## Example

When a new agent is created, the API generates an RSA key pair. Let's assume the key generation process produces the following keys:

- Public Key:

```
-----BEGIN RSA PUBLIC KEY-----
MIICljANBgqhkiG9w0BAQEFAAOCAg8AMIICGgKCAgEAYDRa5PEVYI2T3EzvG1on
...
d8Ou9azXQIDAQAB
-----END RSA PUBLIC KEY-----
```

- Private Key:

```
-----BEGIN RSA PRIVATE KEY-----
```

```
MIIJKQIBAAKCAgEAYDRa5PEVYI2T3EzvG1onC4vPwL...
```

```
...
```

```
8RTgj8SPaHv/SmB2DhYO98C6HpU=
```

```
-----END RSA PRIVATE KEY-----
```

The generated keys are then stored in the agent's record in the MySQL database.

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Revision #1

Created 28 June 2023 09:55:00 by Makito

Updated 3 July 2023 09:39:09 by Makito