stslib Documentation

Release 0.3.12

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Contents

CHAPTER 1

README

1.1 Purpose

stslib (pronounced *s-t-s aay-val*), is a python3 library that requests and manages temporary credentials from Amazon's Security Token Service (STS) on your behalf. **stslib** generates temporary credentials against roles that reside in any number of AWS accounts.

The **stslib** library is commonly used in python applications that generate temporary access credentials for automation tools which need to bypass multi-factor authentication enabled on Amazon APIs. Temporary credentials of this type are are required authenticate to Amazon Web Services (AWS) when automation tooling is used to deploy to tens or even hundreds of AWS accounts simultaneously.

stslib is appropriate for authentication to AWS Services both from within AWS as well by automation tooling runs in an environment external to AWS such as an on-prem datacenter or local machine. local machine.

stslib manages temporary credentials generates credentials in memory for applications that need access to iam roles at AWS. If temporary credentials are needed for extended periods (> 1 hour), **stslib** will automatically renew sts credentials before expiration.

1.2 Documentation

Online:

- Complete html documentation available at http://stslib.readthedocs.io.

Download: Available via download in the formats below

- pdf format

- Amazon Kindle (epub) format

1.3 Getting Started

Before starting, read the following to understand **stslib** key concepts and use cases:

- Frequently Asked Questions (FAQ)
- Credential Format Overview – A primer on the dual credential formats supported by **stslib**
- Code Examples

Current Release:

See v0.3.7 Release Notes

Previous Releases

- v0.2.1 Release Notes
- v0.1.8 Release Notes
- v0.3.6 Release Notes

1.4 Use

Note:

stslib is available via pip in the official python registry
and is licensed under the General Public License v3

1.5 Contact

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Slack: [@blake](https://mpcaws.slack.com/team/blake)
Github: [github_user](https://github.com/fstab50)

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CHAPTER 2

Installation

2.1 Dependencies

- Python3 via one of the following:
  - Python 3.5+
  - Python 3.6+
- Installation of Amazon CLI tools (awscli, see Installation section)
- Linux Operating System, one of the following:
  - Redhat Enterprise Linux v7.X
  - Centos 7.X
  - Ubuntu 14.04, (Ubuntu 16.04 preferred)
  - Amazon Linux (2017.09+)

Note:

Any modern Linux distribution should work, but it must have Python 3.5 + *as a minimum requirement*.

Linux Distribution

Choose your operating system for correct installation instructions:

- *Redhat Enterprise Linux v7.X / Centos 7.X*
- *Ubuntu v16.04+ / Ubuntu-based Distros*
- *Amazon Linux v2017.09 +*

Note:

Any modern Linux distribution should work, but it must have

Python 3.5 + *as a minimum requirement*.

2.2 Redhat Enterprise Linux v7.X / Centos 7.X

- Install Python3 Package Manager

```
$ sudo yum install python3-pip
```

- Install awscli

  Detailed instructions can be found in the README located at: https://github.com/aws/aws-cli/

  The easiest method, provided your platform supports it, is via pip.

```
$ sudo pip3 install awscli
```

- If you have the aws-cli installed and want to upgrade to the latest version you can run:

```
$ sudo pip3 install --upgrade awscli
```

- Installation via pip3 (python3 packages via pip package manager)

```
$ sudo -H pip3 install stslib
```

- Setup and Configuration

```
$ cd /home/user/<stslib directory>/
# $  ...TBD
```

2.3 Ubuntu v16.04+ / Ubuntu-based Distros

- Install Python3 Package Manager

```
$ sudo apt-get install python3-pip
```

- Install awscli

  Detailed instructions can be found in the README located at: https://github.com/aws/aws-cli/

  The easiest method, provided your platform supports it, is via pip.

```
$ sudo pip3 install awscli
```

- If you have the aws-cli installed and want to upgrade to the latest version you can run:

```
$ sudo pip3 install --upgrade awscli
```

- Installation via pip3 (python3 packages via pip package manager)

```
$ sudo -H pip3 install stslib
```

- Setup and Configuration

```
$ cd /home/user/<stslib directory>/
# $  ...TBD
```

2.4 Amazon Linux v2017.09 +

- Install Python3 Package Manager

```
$ sudo yum install python36-pip
```

```
$ sudo -H pip3 install stslib
```

- Setup and Configuration

```
$ cd /home/user/<stslib directory>/
$ python3 ...TBD
```

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CHAPTER 3

Use Cases & Examples

3.1 Generate Session Token (default IAM User)

- `Default` profile in local awscli config. Default user has permissions to assume roles for which **stslib** will generate credentials
- Token with default lifetime (60 minutes)
- Cli *not* protected with MFA (Multi-Factor Authentication, 6 digit code)

```
    from stslib import StsCore

    >>> sts_object = StsCore()
    >>> token = sts_object.generate_session_token()
    >>> print(token)
    <stslib.vault.STSToken at 0x7f05365e3ef0>

    # token attributes

    >>> print(token.start)
    datetime.datetime(2017, 8, 25, 20, 4, 37, tzinfo=tzutc()

    >>> print(token.end)
    datetime.datetime(2017, 8, 25, 21, 4, 36, tzinfo=tzutc())

    >>> print(token.access_key)
    'ASIAI6QV2U3JJAYRHCJQ'

    >>> print(token.secret_key)
    'MdjPAkXTHl12k64LSjmgTWMsmnHk4cJfeMHdXMLA'

    >>> print(token.session)
    'FQoDYXdzEDMaDHAaP2wi/
↪+77fNJJryKvAa20AqGxoQlcRtf8RFLa5Mps9zK9V5SM3Q7+M3h9iNbcxfaZsUnTzFvFwjVZjYKk...zQU='
```

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```
    >>> print(token.boto)     # native boto generated format

{
    'AccessKeyId': 'ASIAI6QV2U3JJAYRHCJQ',
    'StartTime': datetime.datetime(2017, 8, 25, 20, 4, 37, tzinfo=tzutc()),
    'Expiration': datetime.datetime(2017, 8, 25, 21, 4, 36, tzinfo=tzutc()),
    'SecretAccessKey': 'MdjPAkXTHl12k64LSjmgTWMsmnHk4cJfeMHdXMLA',
    'SessionToken': 'FQoDYXdzEDMaDHAaP2wi/
↪+77fNJJryKvAa20AqGxoQlcRtf8RFLa5Mps9zK9V5SM3Q7+M3h9iNbcxfa...zQU='
}
```

3.2 Generate Session Token (named IAM User)

- Named IAM user profile in local awscli config. User has permissions to assume roles for which **stslib** will generate credentials
- MFA protected cli access configuration
- STS Token with default lifetime (60 minutes)

```
    from stslib import StsCore

    >>> sts_object = StsCore(profile_name='BobSmith')
    >>> code = '123456'
    >>> token = sts_object.generate_session_token(mfa_code=code)

    >>> print(token.boto)

{
    'AccessKeyId': 'ASIAI6QV2U3JJAYRHCJQ',
    'StartTime': datetime.datetime(2017, 8, 25, 20, 4, 37, tzinfo=tzutc()),
    'Expiration': datetime.datetime(2017, 8, 25, 21, 4, 36, tzinfo=tzutc()),
    'SecretAccessKey': 'MdjPAkXTHl12k64LSjmgTWMsmnHk4cJfeMHdXMLA',
    'SessionToken': 'FQoDYXdzEDMaDHAaP2wi/+77fNJJryKvAdVZjYKk...zQU='
}
```

3.3 Generate Credentials (1 hour lifetime)

- generate STS temporary credentials, default lifetime (60 minutes)
- Credential format set to 'vault' (default stslib format)
- **stslib** supports 2 credential formats. See the Credential Format Overview.

```
    >>> sts_object = StsCore(profile_name='BobSmith')
    >>> token = sts_object.generate_session_token()
    >>> profile_list = [
            'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod'
        ]
```

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```
            # where profile_list = list of profile names from local awscli config

    >>> sts_object.generate_credentials(profile_list)

    >>> print(credentials)

{
    'sts-DynamoDBRole-dev': <stslib.vault.STSingleSet at 0x7fee0ae05c88>,
    'sts-CodeDeployRole-qa': <stslib.vault.STSingleSet at 0x7fee0ae05f60>,
    'sts-S3ReadOnlyRole-prod': <stslib.vault.STSingleSet at 0x7fee0ae05fd0>
}
```

3.4 Generate Extended Use Credentials (Multi-hour, Auto-refresh)

- Named IAM user profile in local awscli config. User has permissions to assume roles for which stslib will generate credentials
- MFA protected cli configuration
- Credential format set to 'boto' (native Amazon STS format)
- Credentials auto-refreshed for total 5 hour valid lifetime without MFA auth

```
from stslib import StsCore

>>> sts_object = StsCore(profile_name='BobSmith', format='boto')            # boto␣
↪format credentials
>>> code = '123456'
>>> token = sts_object.generate_session_token(lifetime=5, mfa_code=code)    # 5 hour␣
↪lifetime triggers auto-refresh
>>> profile_list = [
        'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod'
    ]

        # where profile_list = list of profile names from local awscli config

>>> sts_object.generate_credentials(profile_list)
>>> credentials = sts_object.current_credentials
```

- **Auto-Refresh of Credentials**: `stslib` will automatically generate new temporary credentials once per hour, prior to expiration (process below)

```
    >>> print(credentials())

{
  'sts-DynamoDBRole-dev': {
      'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAJRW7F2BAVN4J34LQ',
      'SecretAccessKey': 'P8EjwTUKL4hil4Y7Ouo9OkFzQ1IxGikbhIjMP5uN',
      'SessionToken': 'FQoDYXdzEDMaDCpxZzDdwWGok/ylQiLcAdlrHCkxP+kvQOes3mnQ0r5GXt...'
  },
  'sts-CodeDeployRole-qa': {
```

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```
      'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAIOOOKUYFICAPC6TQ',
      'SecretAccessKey': '3Q+N4UMpbmW7OrvY2mfgbjXxr/qt1L4XqmO+Njpq',
      'SessionToken': 'FQoDYXdzEDMaDL/sJkeAF28UsxE/iyLUAbvBrCUoAkP/eqeS...'
  },
  'sts-S3ReadOnlyRole-prod': {
      'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)}}
      'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 46, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAJPRTS4IXPYGPLKZA',
      'SecretAccessKey': 'EMAfJUz5zMNOyjKl7U2IWpJ0GCtWCos0squOE0wz',
      'SessionToken': 'FQoDYXdzEDMaDO0ekTXJi4+IRWV1ESLXAe1ZfOpmGcS9hbIr...'
  }
}

# stdout log stream
/stslib/core.py - 0.2.0 - [INFO]: _validate: Valid account profile names: [
↪'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod']
/stslib/async.py - 0.2.0 - [INFO]: executing event: <bound method StsCore.generate_
↪credentials of <stslib.core.StsCore object at 0x7f91c9df02e8>>
/stslib/async.py - 0.2.0 - [INFO]: thread identifier: Thread-150
/stslib/async.py - 0.2.0 - [INFO]: thread Alive status is: True
/stslib/async.py - 0.2.0 - [INFO]: completed 1 out of 5 total executions
/stslib/async.py - 0.2.0 - [INFO]: remaining in cycle: 4 hours, 59 minutes


  >>> print(credentials())

{
  'sts-DynamoDBRole-dev': {
      'StartTime': datetime.datetime(2017, 10, 1, 15, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 16, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAJRW7F2BAVN4J34LQ',
      'SecretAccessKey': 'P8EjwTUKL4hil4Y7Ouo9OkFzQ1IxGikbhIjMP5uN',
      'SessionToken': 'FQoDYXdzEDMaDCpxZzDdwWGok/ylQiLcAdlrHCkxP+kvQOes3mnQ0r5GXt...'
  },
  'sts-CodeDeployRole-qa': {
      'StartTime': datetime.datetime(2017, 10, 1, 15, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 16, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAIOOOKUYFICAPC6TQ',
      'SecretAccessKey': '3Q+N4UMpbmW7OrvY2mfgbjXxr/qt1L4XqmO+Njpq',
      'SessionToken': 'FQoDYXdzEDMaDL/sJkeAF28UsxE/iyLUAbvBrCUoAkP/eqeS...'
  },
  'sts-S3ReadOnlyRole-prod': {
      'StartTime': datetime.datetime(2017, 10, 1, 15, 17, 45, 652218, tzinfo=<UTC>)}}
      'Expiration': datetime.datetime(2017, 10, 1, 16, 17, 46, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAJPRTS4IXPYGPLKZA',
      'SecretAccessKey': 'EMAfJUz5zMNOyjKl7U2IWpJ0GCtWCos0squOE0wz',
      'SessionToken': 'FQoDYXdzEDMaDO0ekTXJi4+IRWV1ESLXAe1ZfOpmGcS9hbIr...'
  }
}

# stdout log stream
/stslib/core.py - 0.2.0 - [INFO]: _validate: Valid account profile names: [
↪'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod']
/stslib/async.py - 0.2.0 - [INFO]: thread identifier: Thread-150
/stslib/async.py - 0.2.0 - [INFO]: thread Alive status is: True
```

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```
/stslib/async.py - 0.2.0 - [INFO]: completed 2 out of 5 total executions
/stslib/async.py - 0.2.0 - [INFO]: remaining in cycle: 3 hours, 59 minutes
```

3.5 Auto-Refresh Credentials – Additional Info

- Refresh of credentials is non-blocking (via threading)
- Thread management is via event states; threads are terminated as soon as their associated session token expires or they receive a halt event.
- No hanging threads. Any live threads when new credentials generated are safely terminated before generating a new set.

3.6 Non-default IAM Role credentials filename or location

Use-Case: When you wish to use role credentials file not currently part of the awscli, provide a custom location to stslib as a parameter.

- Initialization

```
import stslib

>>> sts_object = stslib.StsCore()
>>> credentials_file = '~/myAccount/role_credentials'    # awscli credentials file,
                                                         # located in ~/.aws
>>> sts_object.refactor(credentials_file)
>>> sts_object.profiles
```

- Output

```
{
    "acme-db-dev": {
        "role_arn": "arn:aws:iam::236600111358:role/AcmeDEV",
        "mfa_serial": "arn:aws:iam::3788881165911:mfa/BillCaster",
        "source_profile": "william-caster"
    },
    "acme-apps-dev": {
        "role_arn": "arn:aws:iam::123660943358:role/AcmeDEV",
        "mfa_serial": "arn:aws:iam::3788881165911:mfa/BillCaster",
        "source_profile": "william-caster"
    },
    "acme-apps-qa": {
        "role_arn": "arn:aws:iam::430864833800:role/AcmeAdmin",
        "mfa_serial": "arn:aws:iam::3788881165911:mfa/BillCaster",
        "source_profile": "william-caster"
    },
    "acme-prod08": {
        "role_arn": "arn:aws:iam::798623437252:role/EC2RORole",
        "mfa_serial": "arn:aws:iam::3788881165911:mfa/BillCaster",
        "source_profile": "william-caster"
```

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```
    },
    "acme-prod09": {
        "role_arn": "arn:aws:iam::123660943358:role/S3Role",
        "mfa_serial": "arn:aws:iam::3788881165911:mfa/BillCaster",
        "source_profile": "william-caster"
    }
}
```

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CHAPTER 4

Frequently Asked Questions

- **Q**: For long-lived (auto-refreshed) credentials, how do I ensure that I always have the latest valid credentials?
- **Q**: How do I access `AccessKeyId` and `SecretAccessKey` values when using stslib's default credential format?
- **Q**: How will **stslib** generate credentials if the profile name in my local awscli config does not match my actual IAM user in my AWS Account?

4.1 Auto-Refreshed Credentials

Q: For long-lived (auto-refreshed) credentials, how do I ensure that I always have the latest valid credentials?

A: There are 2 methods.

> **Method 1** Call `current_credentials` method (Preferred): Seting your application to monitor the `current_credentials` method will ensure you receive *only* valid credentials (the method returns None for expired credentials). You may use this method when generating temporary credentials for any length of time; however, it is especially useful when generating long-lived credentials that are auto-refreshed because is it prevents application code from "polling" `stslib` to see if new credentials have been generated.
>
> - use `current_credentials` method
> - returns *only* valid credentials
> - returns None (`{}`) when credentials are expired

```
>>> sts_object = StsCore(profile_name='BobSmith')
>>> code = '123466'
>>> token = sts_object.generate_session_token(mfa_code=code)
>>> profile_list = ['DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod']
>>> sts_object.generate_credentials(profile_list)
```

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```
>>> credentials = sts_object.current_credentials

>>> credentials()

{
    'sts-DynamoDBRole-dev': <stslib.vault.STSingleSet at 0x7fee0ae05c88>,
    'sts-CodeDeployRole-qa': <stslib.vault.STSingleSet at 0x7fee0ae05f60>,
    'sts-S3ReadOnlyRole-prod': <stslib.vault.STSingleSet at 0x7fee0ae05fd0>
}
```

Method 2: Monitor the `StsCore` credentials class attribute containing the latest copy of credentials:

```
>>> credentials = sts_object.credentials
>>> print(credentials)

{
    'sts-DynamoDBRole-dev': <stslib.vault.STSingleSet at 0x7fee0ae05c88>,
    'sts-CodeDeployRole-qa': <stslib.vault.STSingleSet at 0x7fee0ae05f60>,
    'sts-S3ReadOnlyRole-prod': <stslib.vault.STSingleSet at 0x7fee0ae05fd0>
}
```

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4.2 Using `stslib` Credentials

Q: How do I access `AccessKeyId` and `SecretAccessKey` values when using stslib's default credential format?

A: Example use below:

```
>>> print(credentials)
{
    'sts-DynamoDBRole-dev': <stslib.vault.STSingleSet at 0x7fee0ae05c88>,
    'sts-CodeDeployRole-qa': <stslib.vault.STSingleSet at 0x7fee0ae05f60>,
    'sts-S3ReadOnlyRole-prod': <stslib.vault.STSingleSet at 0x7fee0ae05fd0>
}

>>> credentials['sts-DynamoDBRole-dev'].start
datetime.datetime(2017, 10, 22, 14, 36, 14, 507887, tzinfo=<UTC>)

>>> credentials['sts-DynamoDBRole-dev'].end
datetime.datetime(2017, 10, 22, 15, 36, 14, tzinfo=tzutc())

>>> credentials['sts-DynamoDBRole-dev'].access_key
'ASIAIDK76BMAQWUO4AOQ'

>>> credentials['sts-DynamoDBRole-dev'].secret_key
'LqzseVc4jnjoqKuJM3+Iiobtz0fButHFu7EpNr07'
```

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```
>>> credentials['sts-DynamoDBRole-dev'].expiration     # expiration str in isoformat
'2017-10-22T15:36:14+00:00'
```

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4.3 Miscellaneous Questions

Q: How will **stslib** generate credentials if the profile name in my local awscli config does not match my actual IAM user in my AWS Account?

A: Some basic calls to AWS' sts and iam services do not require MFA even when the Amazon API is protected with MFA. At instantiation, **stslib** maps profile names given to assume roles to IAM users in your account to pinpoint the real IAM username to be used when assuming roles.

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CHAPTER 5

License

```
GNU GENERAL PUBLIC LICENSE
   Version 3, 29 June 2007
```



```
Preamble
```

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The precise terms and conditions for copying, distribution and modification follow.

```
TERMS AND CONDITIONS
```

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1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

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```

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```
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CHAPTER 6

Credential Formats

stslib supports 2 different output formats when generating temporary credentials:

1. **stslib** `vault` Format (DEFAULT). Enhanced, custom credential format
2. Native `boto` Format. Amazon STS temporary credential format returned by the boto3 python SDK

Important:

Either credential format can be selected by setting the `format` class attribute parameter when instantiating the `StsCore` class.

You may change the default **stslib** format in the config file `*/stslib/config.yml`

CHAPTER 7

`vault` | Default Format

- Access values by specifying credential key + object attribute
- Out-of-the-box default for stslib library
- Additional custom parameters:
  - `StartTime`: datetime object representing the datetime stamp of credential generation
  - `duration` Attribute (datetime object)
  - `expiration` Attribute (Expiration datetime stamp in string format)

`vault` **Code Example**:

```
    >>> from stslib import StsCore

    >>> sts_object = StsCore(profile_name='BobSmith')
    >>> code = '123466'
    >>> token = sts_object.generate_session_token(mfa_code=code)
    >>> profile_list = [

            'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod'
        ]

            # where profile_list = list of profile names from local awscli config

    >>> credentials = sts_object.generate_credentials(profile_list)

    >>> print(credentials)

{
    'sts-DynamoDBRole-dev': <stslib.vault.STSingleSet at 0x7fee0ae05c88>,
    'sts-CodeDeployRole-qa': <stslib.vault.STSingleSet at 0x7fee0ae05f60>,
    'sts-S3ReadOnlyRole-prod': <stslib.vault.STSingleSet at 0x7fee0ae05fd0>
}
```

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```
    >>> credentials['sts-DynamoDBRole-dev'].start
    datetime.datetime(2017, 10, 22, 14, 36, 14, 507887, tzinfo=<UTC>)

    >>> credentials['sts-DynamoDBRole-dev'].end
    datetime.datetime(2017, 10, 22, 15, 36, 14, tzinfo=tzutc())

    >>> credentials['sts-DynamoDBRole-dev'].access_key
    'ASIAIDK76BMAQWUO4AOQ'

    >>> credentials['sts-DynamoDBRole-dev'].secret_key
    'LqzseVc4jnjoqKuJM3+Iiobtz0fButHFu7EpNr07'

    >>> credentials['sts-DynamoDBRole-dev'].duration
    datetime.timedelta(0, 3600, 251871)

    >>> credentials['sts-DynamoDBRole-dev'].expiration     # expiration str in␣
↪isoformat
    '2017-10-22T15:36:14+00:00'

    # Identical attributes available for other roles in the credential set

    >>> credentials['sts-CodeDeployRole-qa'].start
    datetime.datetime(2017, 10, 22, 14, 36, 15, 53567, tzinfo=<UTC>)

    >>> credentials['sts-CodeDeployRole-qa'].end
    datetime.datetime(2017, 10, 22, 15, 36, 15, tzinfo=tzutc())

    >>> credentials['sts-CodeDeployRole-qa'].access_key
    'ASIAIDK76BMA573F4ABD'

    >>> credentials['sts-CodeDeployRole-qa'].secret_key
    'LqzseVc4jnjoqKuJM3+Iiobdlkj9335u7Ep023jlk'

    # ... etc
```

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CHAPTER 8

`boto` | Native Amazon STS Format

- Legacy applications
- Applications where translation of STS credentials is not authorized or discouraged
- Enable format when instantiating `StsCore` class (example below)

`boto` **Code Example**:

```
    >>> from stslib import StsCore

    >>> sts_object = StsCore(profile_name='BobSmith', format='boto')
    >>> token = sts_object.generate_session_token()
    >>> profile_list = [

            'DynamoDBRole-dev', 'CodeDeployRole-qa', 'S3ReadOnlyRole-prod'
        ]

            # where profile_list = list of profile names from local awscli config

    >>> credentials = sts_object.generate_credentials(profile_list)

    >>> print(credentials)          # boto format credentials

{
  'sts-DynamoDBRole-dev': {
      'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAJRW7F2BAVN4J34LQ',
      'SecretAccessKey': 'P8EjwTUKL4hil4Y7Ouo9OkFzQ1IxGikbhIjMP5uN',
      'SessionToken': 'FQoDYXdzEDMaDCpxZzDdwWGok/ylQiLcAdlrHCkxP+kvQOes3mnQ0r5GXt...'
  },
  'sts-CodeDeployRole-qa': {
      'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)},
      'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 45, tzinfo=tzutc()),
      'AccessKeyId': 'ASIAIOOOKUYFICAPC6TQ',
```

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```
        'SecretAccessKey': '3Q+N4UMpbmW7OrvY2mfgbjXxr/qt1L4XqmO+Njpq',
        'SessionToken': 'FQoDYXdzEDMaDL/sJkeAF28UsxE/iyLUAbvBrCUoAkP/eqeS...'
    },
    'sts-S3ReadOnlyRole-prod': {
        'StartTime': datetime.datetime(2017, 10, 1, 14, 17, 45, 652218, tzinfo=<UTC>)}}
        'Expiration': datetime.datetime(2017, 10, 1, 15, 17, 46, tzinfo=tzutc()),
        'AccessKeyId': 'ASIAJPRTS4IXPYGPLKZA',
        'SecretAccessKey': 'EMAfJUz5zMNOyjKl7U2IWpJ0GCtWCos0squOE0wz',
        'SessionToken': 'FQoDYXdzEDMaDO0ekTXJi4+IRWV1ESLXAe1ZfOpmGcS9hbIr...'
    }
}
```

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CHAPTER 9

Session Token Format

- Custom **stslib** Format
- Access values by specifying token attributes
- Default token format
- Additional Parameters not present in STS tokens generated by boto:
  - `StartTime`: datetime object representing the datetime stamp of credential generation
  - `boto`: attribute holding the native STS format of the token as returned from Amazon STS

Session Token Example:

```
>>> from stslib import StsCore

>>> sts_object = StsCore()
>>> token = sts_object.generate_session_token()
>>> print(token)
<stslib.vault.STSToken at 0x7f05365e3ef0>

# token attributes

>>> print(token.start)
datetime.datetime(2017, 8, 25, 20, 4, 37, tzinfo=tzutc()

>>> print(token.end)
datetime.datetime(2017, 8, 25, 21, 4, 36, tzinfo=tzutc())

>>> print(token.access_key)
'ASIAI6QV2U3JJAYRHCJQ'

>>> print(token.secret_key)
'MdjPAkXTHl12k64LSjmgTWMsmnHk4cJfeMHdXMLA'

>>> print(token.session)
```

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```
    'FQoDYXdzEDMaDHAaP2wi/
↪+77fNJJryKvAa20AqGxoQlcRtf8RFLa5Mps9zK9V5SM3Q7+M3h9iNbcxfaZsUnTzFvFwjVZjYKk...zQU='

    >>> print(token.boto)    # native boto generated format

{
    'AccessKeyId': 'ASIAI6QV2U3JJAYRHCJQ',
    'StartTime': datetime.datetime(2017, 8, 25, 20, 4, 37, tzinfo=tzutc()),
    'Expiration': datetime.datetime(2017, 8, 25, 21, 4, 36, tzinfo=tzutc()),
    'SecretAccessKey': 'MdjPAkXTHl12k64LSjmgTWMsmnHk4cJfeMHdXMLA',
    'SessionToken': 'FQoDYXdzEDMaDHAaP2wi/
↪+77fNJJryKvAa20AqGxoQlcRtf8RFLa5Mps9zK9V5SM3Q7+M3h9iNbcxfa...zQU='
}
```

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CHAPTER 10

Code Examples

10.1 Cross-Account Credentials

- How to generate temporary credentials for roles in different AWS accounts.

10.2 Amazon S3

- Access Amazon S3 using Auto-refreshed temporary credentials

10.3 Local Machine Temporary Credentials

- Setting up the Default Session using Boto3 and STS temporary credentials

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CHAPTER 11

Enhancement Roadmap

stslib v0.X: Beta

- *Session Token*: generation and mgmt of single set only
- *Credentials*: generation and mgmt of single set only

stslib v1.0: Stable

- *Session Token*: generation and mgmt of single set only
- *Credentials*: generation and mgmt of single set only
- *Persistence*: credentials persisted in memory only

stslib v2.0: Stable

- *Session Token*: generation and mgmt of up to 3 tokens simultaneously
- *Credentials*: generation and mgmt of single set per token
- *Persistence*: in memory credentials + persist to disk

Current Issues and Enhancements

For a complete list of enhancements logged against the stslib project,
see the list of stslib issues.

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CHAPTER 12

Current Release

12.1 v0.3.7 | Release Notes

Release date: November 1, 2017

12.1.1 Documentation Release

- **ReadTheDocs.io**: sphinx auto document generation, release to: http://stslib.readthedocs.io.
- Latest Feature Release is v0.3.6.

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CHAPTER 13

Release History

13.1 v0.1.8 | Release Notes

Release date: September 8, 2017

13.1.1 Features Implemented, v0.1.8

- **Thread Management**: Thread persistence solved with threading event based wait states
- **Token & Credential Lifetime**: Method to retrieve both token and credentials life remaining. Two forms returned: datatime.timedelta objects for programmatic use or human_readable format.

13.1.2 Limitations, v0.1.8

Non-Default Credential Files

- Instantiation of stslib objects with non-default credentials filename or file location (ie outside of default awscli config) currently broken.

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13.2 v0.2.1 | Release Notes

Release date: September 23, 2017

13.2.1 Features Implemented, v0.2.1

- **Debug Mode**: Now user configurable
- **Documentation Updates**: README received extensive updates in this release
- **Issues with Non-Default Credential Files:** Instantiation of stslib objects with non-default credentials filename or file location (ie outside of default awscli config) previously broken. Processes role profile info correctly when passed to StsCore from a non-standard location outside of `~/.aws` when contained in a file with a non-standard file name.

13.2.2 Limitations, v0.2.1

- **Various**: Bugs and Issues associated with alpha-level project

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13.3 v0.3.6 | Release Notes

Release date: October 22, 2017

13.3.1 Features Implemented, v0.3.6

- **STSToken Session Token Custom Format**: stslib now generates session tokens in a custom format which is much
  easier to consume. See FAQ documentation.
- **STSCredential Credential Custom Format**: stslib now generates session tokens in a custom format which is much
  easier to consume. See FAQ documentation.
- **Dual Credential Format Support**: Credentials may be generated in one of 2 formats:
  1. stslib Custom Format (default). See FAQ documentation.
  2. `boto` Format: native format generated by Amazon's boto library
- **Logging Formats**: stslib now has 2 log output formats available:

  - Streamhandler
  - FileHandler (default)

  Either can be set as the default in the `~/.stslib/config.yml` module

  Log format can be set at runtime via the `log_mode` parameter provided when `StsCore` instantiated

- **Documentation Updates**: README received extensive updates in this release
- Various bug fixes

13.3.2 Limitations, v0.3.6

Generation of Multiple Credential Sets

Credential sets which are maintained simultaneously is planned for v2.0

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CHAPTER 15

Site Index

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CHAPTER 16

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