

## MiNiFi C++ Agent Installation

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## Install the MiNiFi C++ agent

Learn how to install the MiNiFi C++ agent. You need to install and configure the MiNiFi C++ agent and then start it. You can also do the same on Windows.

### Before you begin installing MiNiFi C++ agent

To start using the MiNiFi C++ agent, you need to install it. Learn how to obtain the MiNiFi C++ software bit, install the agent, and configure it. Also learn the system requirements to do so.

### System requirements for MiNiFi C++

Carefully review the system requirements for MiNiFi C++ before you begin installing it.

#### Operating system support in CEM MiNiFi C++ Agent 1.24.05 release

| Operating System    | Version                                                      |
|---------------------|--------------------------------------------------------------|
| RHEL and compatible | 8.x, 9.x                                                     |
| Debian              | 11, 12                                                       |
| Ubuntu              | 20.04, 22.04, 24.04                                          |
| Windows             | 8, 10, Server 2012, Server 2012 R2, Server 2016, Server 2019 |

#### Operating system support in CEM MiNiFi C++ Agent 1.21.10 - 1.24.04 releases

| Operating System | Version                                                      |
|------------------|--------------------------------------------------------------|
| RHEL/CentOS      | 7.x, 8.x                                                     |
| Debian           | 10, 11                                                       |
| Ubuntu           | 18.04, 20.04                                                 |
| Windows          | 8, 10, Server 2012, Server 2012 R2, Server 2016, Server 2019 |

#### Operating system support in CEM MiNiFi C++ Agent 1.21.06 and 1.21.08 releases

| Operating System | Version                                                      |
|------------------|--------------------------------------------------------------|
| RHEL/CentOS      | 7.x, 8.x                                                     |
| Debian           | 10                                                           |
| Ubuntu           | 18.04, 20.04                                                 |
| Windows          | 8, 10, Server 2012, Server 2012 R2, Server 2016, Server 2019 |

#### Operating system support in releases before CEM MiNiFi C++ Agent 1.21.06

| Operating System | Version                                                      |
|------------------|--------------------------------------------------------------|
| RHEL/CentOS      | 7.x, 8.x                                                     |
| Debian           | 9                                                            |
| Ubuntu           | 16.04, 18.04                                                 |
| Windows          | 8, 10, Server 2012, Server 2012 R2, Server 2016, Server 2019 |

## Before you begin MiNiFi agent installation on Windows

You must go through the prerequisites before you begin installation of MiNiFi agent on Windows.

### Requirements

Apache NiFi MiNiFi C++ is built on Window Server 2016, 2019, and Windows 10 operating systems. Since the project is CMake focused, Cloudera recommends building the Microsoft Installer (MSI) or Windows Installer through the `ms_build.bat` script. In order to build the MSI, please install the WiX Toolset.

The project previously required OpenSSL to be installed. If you follow Cloudera build procedures, you do not need to install that dependency. Further, any MSI distributable requires that systems install the Visual Studio 2010 redistributables.

### Building through the build script

The preferred way of building the project is through the `win_build_vs.bat` script found in the root source folder.

You must supply a single command, the build directory. Typically you create a directory with CMake and build the MSI in that directory referencing your CMake tree. Simply supply the `win_build_vs.bat` an argument like `build` as the name of your build directory and it will create this directory building the project within it. Alternatively, you can use the `win_build_vs.bat build /K /T /P` command to build Kafka, skip tests, and build the CMake at the same time.

If WiX Toolset is installed, `cpack` creates your MSI in the chosen build directory.

You can also build a 64 bit MSI by adding the `/64` option. To do so, you require the 64-bit version of the Visual Studio redistributables mentioned in system requirements.



**Note:** The 64-bit MSI will not run on 32-bit Microsoft Windows platforms. However, the 32-bit MSI will work across distributions.

## Install your MiNiFi C++ agent

To install your MiNiFi C++ agent, you need to download the software for the agent and extract it.

### Procedure

1. Download the tar.gz or zip files for the MiNiFi C++ agent.

```
wget {cpp.tar.gz}
```

2. To install the MiNiFi C++ agent, extract the file to your desired home directory.

## Install the C++ agent on Windows from command line

Learn how to install MiNiFi C++ agent from command line.

### Procedure

1. To install the MiNiFi C++ agent from the Command Line with the desired extensions, list all the extensions you would like to install:

```
msiexec /i nifi-minifi-cpp.msi AGREETOLICENSE=Yes ADDLOCAL=CM_C_bin,CM_C_tzdata,InstallService,InstallVSRedistributableFiles,InstallConf,CM_C_https_curl,CM_C_sql /quiet
```

- Optional. In order to exclude some extensions but otherwise install all other extensions:

```
msiexec /i nifi-minifi-cpp.msi AGREETOLICENSE=Yes ADDLOCAL=ALL REMOVE=CM_C_sql /quiet
```

For all extension identifiers (for example, CM\_C\_sql), follow the same pattern. Take the extension name (for example, minifi-sql), replace the minifi- prefix with CM\_C\_ and replace all dashes with underscores. For example, minifi-http-curl becomes CM\_C\_http\_curl.



**Note:** For the agent to be able to connect to the EFM server, you must have the minifi-http-curl extension installed.

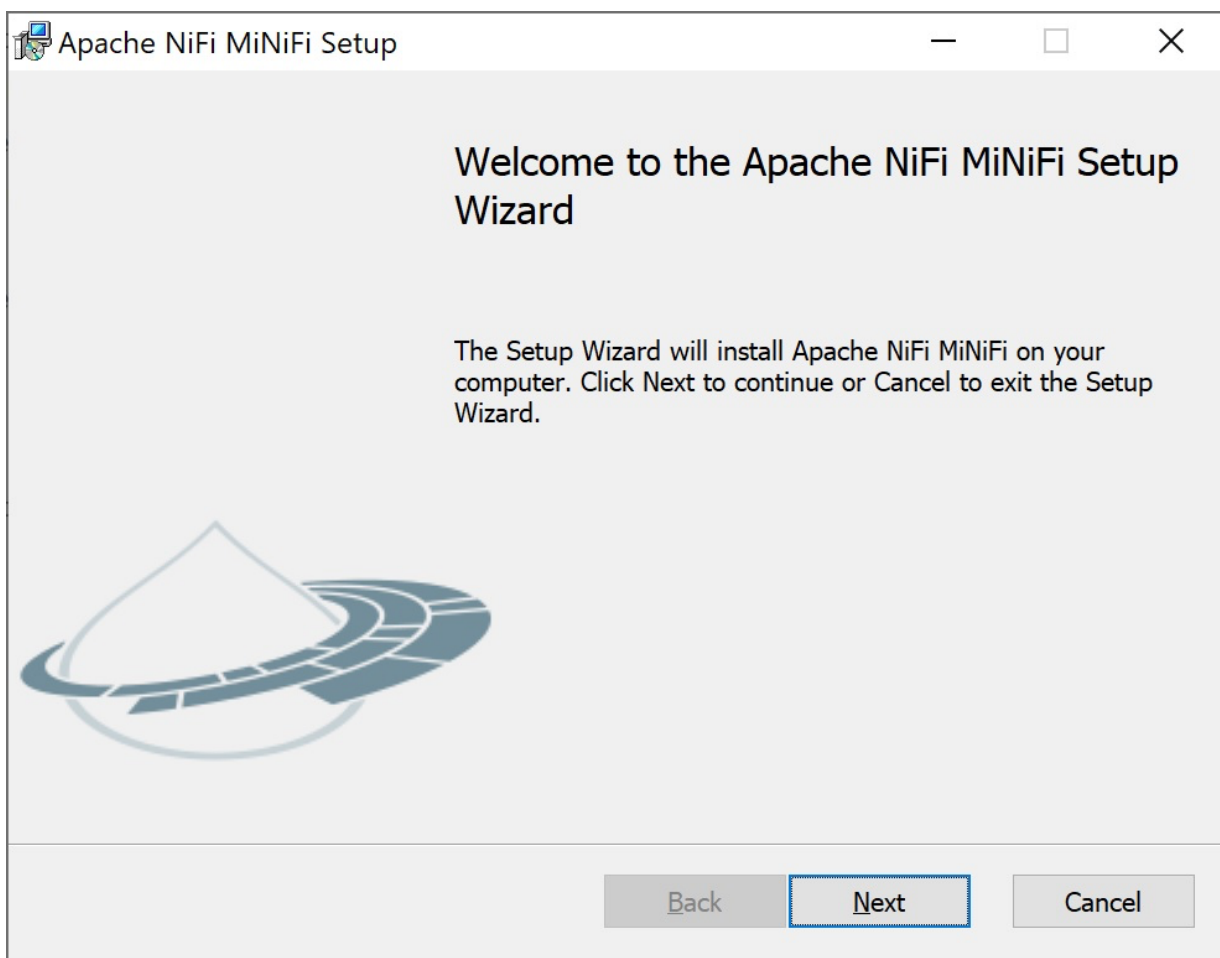
For more information and configuration options for msiexec, see <https://docs.microsoft.com/en-us/windows-server/administration/windows-commands/msiexec>.

## Install the C++ agent on Windows using the MSI

Learn how to install and configure the MiNiFi C++ agent on Windows by using the provided MSI.

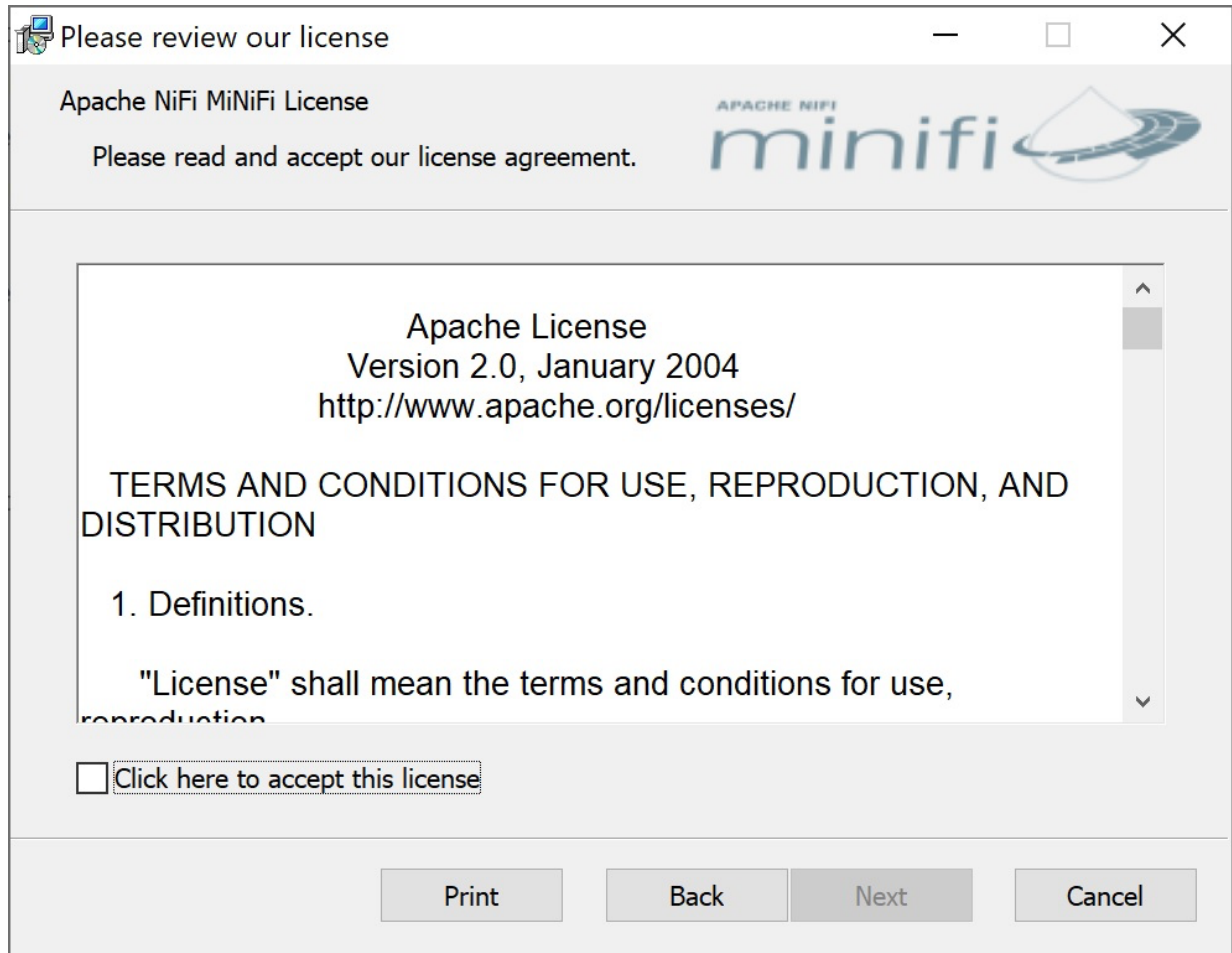
### Procedure

- Open the Apache NiFi MiNiFi Setup wizard, and click Next.



The Apache NiFi MiNiFi License page appears.

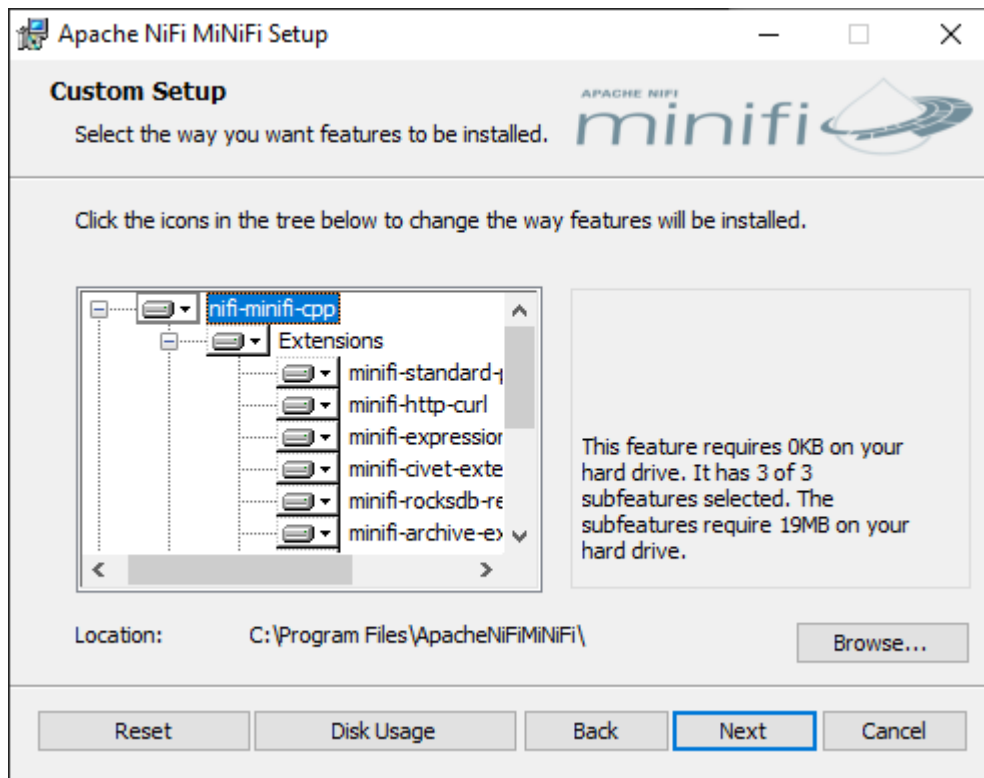
2. Check the Click here to accept this license option, and click Next.



The Custom Setup page appears.

3. Select the extensions you need to install.

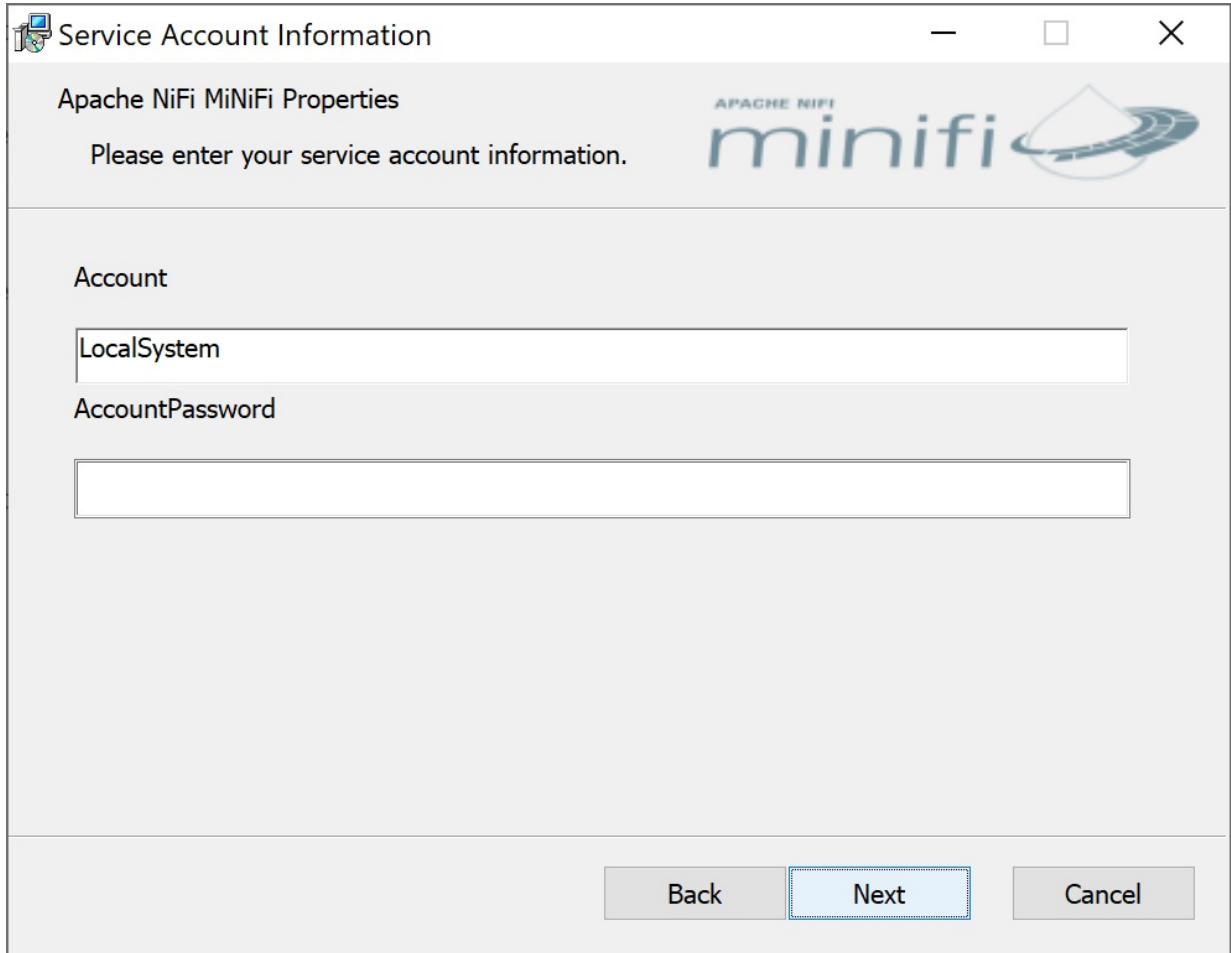
By default, all extensions are enabled.



4. Click Next.

The Service Account Information page appears.

5. Enter a user for the windows service that is installed and a password.



The image shows a Windows-style dialog box titled "Service Account Information". The title bar includes a standard icon, the text "Service Account Information", and window control buttons (minimize, maximize, close). The dialog has a header section with the text "Apache NiFi MiNiFi Properties" and "Please enter your service account information." on the left, and the "minifi" logo on the right. The main area contains two labels: "Account" and "AccountPassword". Below "Account" is a text box containing "LocalSystem". Below "AccountPassword" is an empty text box. At the bottom right, there are three buttons: "Back", "Next" (which is highlighted with a blue border), and "Cancel".

Service Account Information

Apache NiFi MiNiFi Properties

Please enter your service account information.

Account

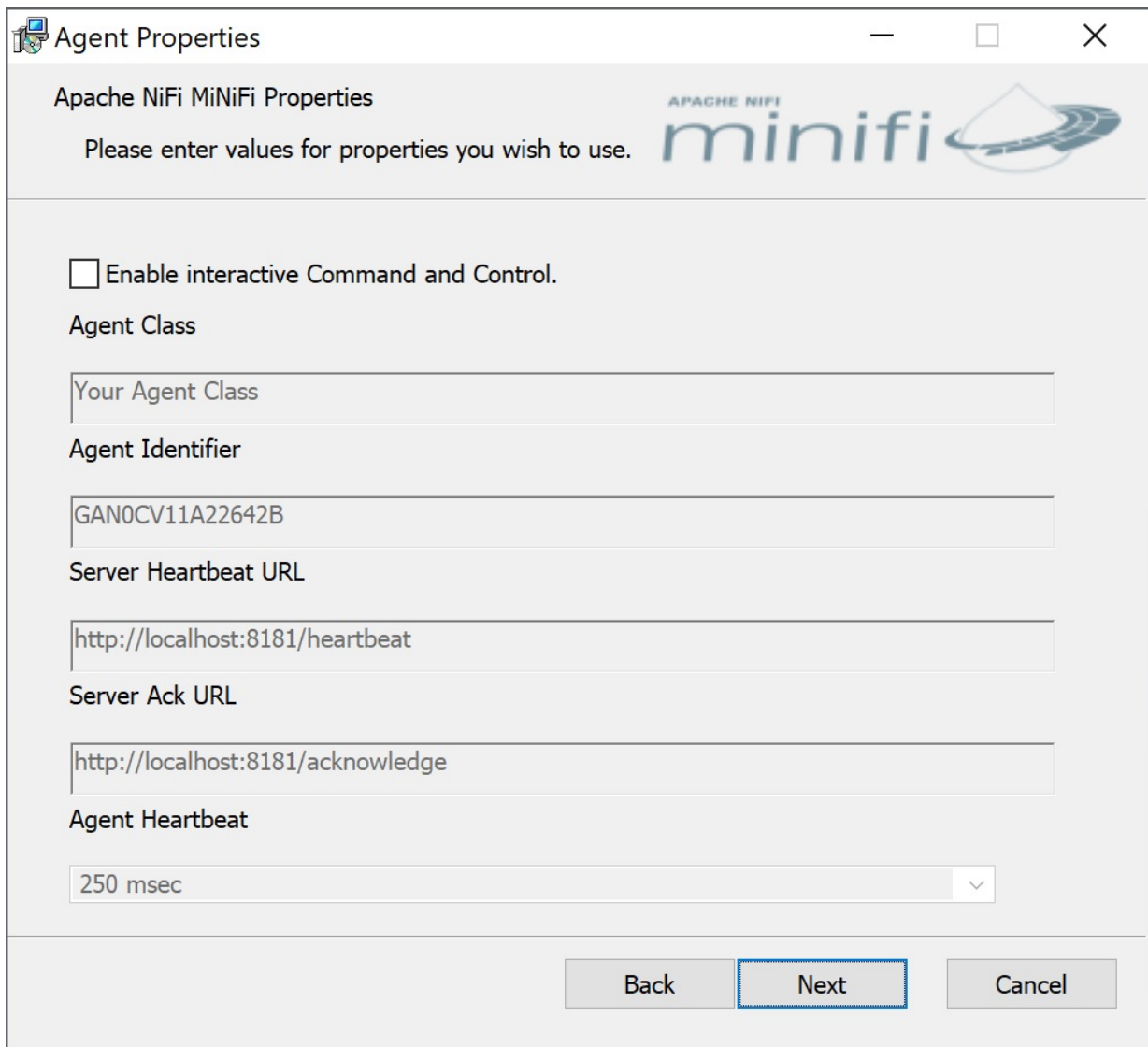
LocalSystem

AccountPassword

Back Next Cancel

6. Click Next.

The Agent Properties page appears as shown in the following image:



The screenshot shows a window titled "Agent Properties" with a standard Windows title bar (minimize, maximize, close buttons). The window has a header bar with the text "Apache NiFi MiNiFi Properties" and the Apache NiFi logo. Below the header, there is a prompt: "Please enter values for properties you wish to use." The main area contains several form fields: a checkbox for "Enable interactive Command and Control." which is unchecked; a text field for "Agent Class" with the placeholder text "Your Agent Class"; a text field for "Agent Identifier" containing the value "GAN0CV11A22642B"; a text field for "Server Heartbeat URL" containing the value "http://localhost:8181/heartbeat"; a text field for "Server Ack URL" containing the value "http://localhost:8181/acknowledge"; and a dropdown menu for "Agent Heartbeat" currently showing "250 msec". At the bottom right, there are three buttons: "Back", "Next" (which is highlighted with a blue border), and "Cancel".

7. Check the Enable interactive Command and Control option.

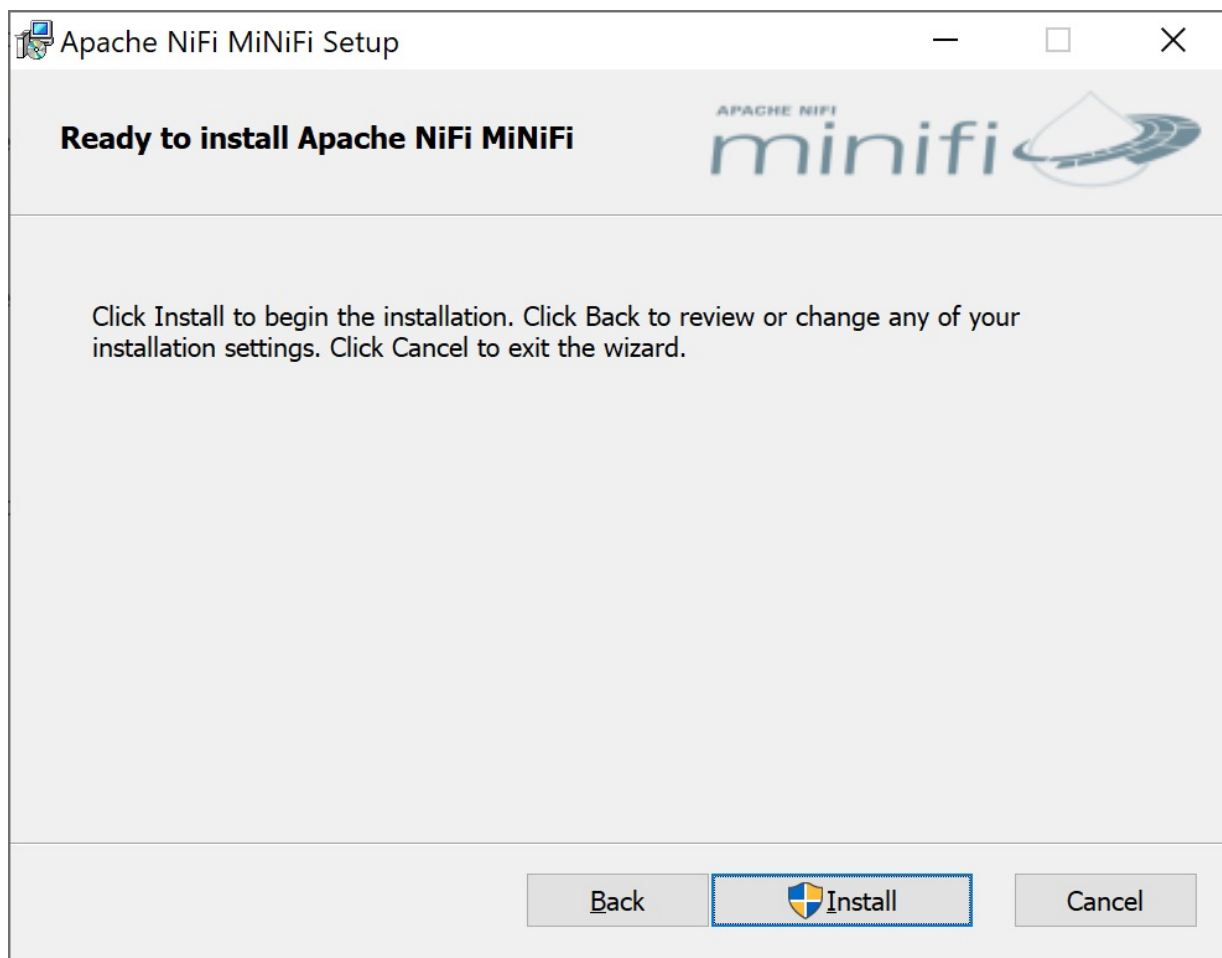
After you enable this option, you can edit your properties.

8. Edit the following properties:

- Agent Class
- Agent Identifier
- Server Heartbeat URL
- Server Ack URL
- Agent Heartbeat

9. Click Next.

10. Click Install.



## MiNiFi C++ agent configurations

Learn about different configurations that you can perform for your MiNiFi C++ agent.

### Configuring your MiNiFi C++ agent

After you install the MiNiFi C++ agent, you need to update the configuration files.

#### About this task

MiNiFi C++ is configured through two files: `minifi.properties` is used for general configuration and `config.yml` is used for configuring your flow.



**Note:** MiNiFi C++ does not auto-generate or overwrite settings in `conf/minifi.properties`, and it does not support the NiFi Properties Overrides syntax in `config.yml`.

Follow these steps to configure the MiNiFi C++ agent:

#### Procedure

1. From the MiNiFi home directory, open the `minifi.properties` configuration file.

2. Configure the agent class so that you can logically group MiNiFi C++ instances according to their functionality.

```
nifi.c2.agent.class=[***AGENT_CLASS***]
```

Replace `[***AGENT_CLASS***]` with the name of your agent class, for example: `nifi.c2.agent.class=my_agent_class`



**Note:** Leading and trailing whitespaces are accepted for Agent Class names so consider this when configuring agents.

3. Configure the ID of the agent. If you do not specify an agent ID, MiNiFi generates a unique ID per agent instance.

```
nifi.c2.agent.identifier=[***AGENT_ID***]
```

Replace `[***AGENT_ID***]` with the ID of your choice, for example: `nifi.c2.agent.identifier=minifi_cpp_13`

4. Set the `nifi.c2.enable` property to true to inform MiNiFi that run time flow instructions will be received from EFM.

```
nifi.c2.enable=true
```

5. Configure your EFM server endpoint:

```
nifi.c2.rest.url=http://[***EFM_SERVER_IP_ADDRESS***]:10090/efm/api/c2-protocol/heartbeat
nifi.c2.rest.url.ack=http://[***EFM_SERVER_IP_ADDRESS***]:10090/efm/api/c2-protocol/acknowledge
```

Replace `[***EFM_SERVER_IP_ADDRESS***]` with the IP address of the EFM server endpoint, for example with `efm-host.corp.local`

6. Configure your heartbeat interval:

```
nifi.c2.agent.heartbeat.period=[***HEARTBEAT_INTERVAL***]
```

Replace `[***HEARTBEAT_INTERVAL***]` with the time period you want to set as the frequency for the the agent to send a heartbeat to EFM.

For example: `nifi.c2.agent.heartbeat.period=5000`

5 sec is also a valid value.

7. Configure the metrics for your MiNiFi C++ agent.

For more information, see [Metrics in the Apache NiFi - MiNiFi - C++ C2 Readme](#).

```
nifi.c2.root.class.definitions=metrics
nifi.c2.root.class.definitions.metrics.name=metrics
nifi.c2.root.class.definitions.metrics.metrics=runtimeMetrics,loadMetrics,processorMetrics
nifi.c2.root.class.definitions.metrics.metrics.runtimeMetrics.name=RuntimeMetrics
nifi.c2.root.class.definitions.metrics.metrics.runtimeMetrics.classes=DeviceInfoNode,FlowInformation
nifi.c2.root.class.definitions.metrics.metrics.loadMetrics.name=LoadMetrics
nifi.c2.root.class.definitions.metrics.metrics.loadMetrics.classes=QueueMetrics,RepositoryMetrics
nifi.c2.root.class.definitions.metrics.metrics.processorMetrics.name=ProcessorMetric
nifi.c2.root.class.definitions.metrics.metrics.processorMetrics.classes=GetFileMetrics
```

## 8. Restart the agent.

For the list of supported MiNiFi C++ processors, see *MiNiFi C++ agent processor support*.

### Related Information

[MiNiFi C++ agent processor support](#)

[Metrics in the Apache NiFi - MiNiFi - C++ C2 Readme](#)

## Configuring communication with secured EFM

To communicate with secured EFM, you need to configure additional properties.

### About this task

If you are configuring a MiNiFi C++ agent, the file is `conf/minifi.properties`.

### Procedure

For the C++ agent, configure the following additional properties in the `minifi.properties` file to communicate with a secured EFM:

```
# Security Properties #
# enable tls #
nifi.remote.input.secure=true
# if you want to enable client certificate base authorization #
nifi.security.need.ClientAuth=true
# setup the client certificate and private key PEM files #
nifi.security.client.certificate=
nifi.security.client.private.key=
# setup the client private key passphrase file #
nifi.security.client.pass.phrase=./conf/password
# setup the client CA certificate file #
nifi.security.client.ca.certificate=
```

## Configuring MiNiFi C++ repositories

Learn how to configure and encrypt MiNiFi C++ repositories.

Similarly to NiFi, the MiNiFi C++ agent uses repositories to store state. There are three kinds of repositories:

- The Content repository is used to store the contents of each flow file.
- The Flow File repository contains flow file metadata, like the current state and attributes of every flowfile, and a content repository identifier.
- The Provenance repository can track changes and store all the events of all flowfiles. It is not well maintained, and it is disabled by default.

### Configuring repository storage locations

Persistent repositories use a configurable path to store data. The repository locations and their defaults are defined below. By default the `MINIFI_HOME` environment variable is used. If you do not specify this variable, the root installation folder is used. You may specify your own path replacing these defaults in the `minifi.properties` file.

```
nifi.database.content.repository.directory.default=${MINIFI_HOME}/content_re
pository
nifi.flowfile.repository.directory.default=${MINIFI_HOME}/flowfile_reposito
ry
nifi.provenance.repository.directory.default=${MINIFI_HOME}/provenance_re
pository
```

You can also use a single database to store multiple repositories with the `minifidb://` scheme. This could help with migration and centralize agent state persistence. In the scheme, the final path segment designates the column family in the repository, while the preceding path indicates the directory where the rocksdb database is created.

For example: In `minifidb:///home/user/minifi/agent_state/flowfile`, a directory is created at `/home/user/minifi/agent_state` populated with rocksdb-specific content. In that repository, a logically separate subdatabase is created under the name `flowfile`.

```
nifi.flowfile.repository.directory.default=minifidb://${MINIFI_HOME}/agent_s
tate/flowfile nifi.database.content.repository.directory.default=minifidb://
${MINIFI_HOME}/agent_state/content
nifi.state.manangement.provider.local.path=minifidb://${MINIFI_HOME}/agen
t_state/processor_states
```



**Note:** You should not use the same directory with and without the `minifidb://` scheme simultaneously. Moreover, the default name is restricted and should not be used.

## Configuring repository backends

You can configure all three repositories to be volatile or persistent. Configuring volatile repositories means that their state is kept in memory and flushed upon restart. This can increase the performance, but can also cause data loss in case of restart while data is being processed by the agent.

### Content repository

By default, the content repository uses a RocksDB backend, which is a persistent, in-process key-value store. There is another, filesystem-based alternative backend for this repository. In most use cases, the RocksDB backend offers better performance and transactional guarantees over the filesystem backend, but it has a limitation: it cannot store flow file contents larger than 4 GB.

You can configure the repository backends in the `minifi.properties` file as follows:

`nifi.content.repository.class.name`

Possible values:

- `DatabaseContentRepository`: RocksDB backend - This is the default value.
- `FilesystemRepository`: file system backend - Use it if you work with flow files larger than 4 GB.
- `VolatileContentRepository`: in-memory, non-persistent storage backend - You should only use it for testing.

### Flow File repository

By default, the flow file repository uses a RocksDB backend, which is a persistent, in-process key-value store.

You can configure the repository backends in the `minifi.properties` file as follows:

`nifi.flowfile.repository.class.name`

Possible values:

- `FlowFileRepository`: RocksDB backend - this is the default value
- `VolatileFlowFileRepository`: in-memory, non-persistent storage backend - you should only use it for testing.

### Provenance repository

Cloudera does not recommend changing the provenance repository backend. If you need NiFi-style provenance data, contact your Cloudera representative with the feature request.

You can configure the repository backends in the `minifi.properties` file as follows:

`nifi.provenance.repository.class.name`

Possible values:

- NoOpRepository: disable provenance - this is the default value
- ProvenanceRepository: RocksDB backend - You should not use this backend repository as it is not thoroughly tested. Cloudera advises caution if you decide to use it.
- VolatileProvenanceFileRepository: in-memory, non-persistent storage backend - You should only use it for testing.

Other configuration options for volatile repositories:

```
# configuration options
# maximum number of entries to keep in memory
nifi.volatile.repository.options.flowfile.max.count=10000

# maximum number of bytes to keep in memory
nifi.volatile.repository.options.flowfile.max.bytes=1M

# maximum number of entries to keep in memory
nifi.volatile.repository.options.provenance.max.count=10000
# maximum number of bytes to keep in memory
nifi.volatile.repository.options.provenance.max.bytes=1M

# maximum number of entries to keep in memory
nifi.volatile.repository.options.content.max.count=100000
# maximum number of bytes to keep in memory
nifi.volatile.repository.options.content.max.bytes=1M

# limits locking for the content repository
nifi.volatile.repository.options.content.minimal.locking=true
```

Systems that have limited memory must be cognisant of the above options. Limiting the maximum count for the number of entries limits memory consumption but it also limits the number of events that can be stored. If you limit the amount of volatile content you are configuring, you may have excessive session rollback due to invalid stream errors that occur when a claim cannot be found.

## Repository encryption

You can encrypt the repository starting with the CEM Agents 1.21.06 release.

You can provide the RocksDB-backed repositories with a key to request their encryption (using AES-256-CTR) in the conf/bootstrap.conf file:

```
nifi.flowfile.repository.encryption.key=805D7B95EF44DC27C87FFBC4DFDE376DAE60
4D55DB2C5496DEEF5236362DE62E
nifi.database.content.repository.encryption.key=
# nifi.state.management.provider.local.encryption.key=
```

In the above configuration, the first line makes the Flow File repository use the specified 256-bit key. The second line triggers the generation of a random 256-bit key persisted back into conf/bootstrap.conf, which the Content repository then uses for encryption. This way, you can request encryption without being concerned about what key to use. Finally, as the last line is commented out, it makes the state manager use plaintext storage and not trigger encryption.

When multiple repositories use the same directory (as with minifidb:// scheme), the repositories should either be all plaintext or all encrypted with the same key.

## Encrypting sensitive data

You can prevent accidental exposure of passwords by encrypting sensitive configuration properties in the minifi.properties file. Learn how to encrypt sensitive data.

MiNiFi comes with a tool called `encrypt-config` (`encrypt-config.exe` on Windows) which can be found in the `bin` directory of the installation, next to the main `minifi` binary. It enables the encryption of sensitive configuration properties in the `minifi.properties` file along with the encryption of the flow configuration (`config.yml` by default).

The security of the encryption depends on the security of the `bootstrap.conf` file, which contains the encryption key.



**Note:** This feature is available starting with the release of MiNiFi C++ 1.20.09.

The terminologies used in this section are as follows:

- `minifi home`

The directory as specified to `encrypt-config` by the `--minifi-home` option.

- `configuration directory`

The `<minifi home>/conf` directory.

- `properties file`

The `<minifi home>/conf/minifi.properties` file.

- `flow configuration`

The file specified in the properties file with the key `nifi.flow.configuration.file`, or if not specified it defaults to `<minifi home>/conf/config.yml`.

- `bootstrap file`

The file `<minifi home>/conf/bootstrap.conf`.

- `sensitive property`

All property in the properties file that we wish to encrypt.

## Encryption of the configuration properties

If you have a `minifi.properties` file in your MiNiFi configuration directory `/var/tmp/minifi-home/conf` containing the following sensitive properties:

```
minifi-properties
...
nifi.security.client.pass.phrase=my_pass_phrase
...
nifi.rest.api.user.name=admin
nifi.rest.api.password=password123
...
```

you can run the `encrypt-config` tool as shown in the following example:

```
$ ./bin/encrypt-config --minifi-home /var/tmp/minifi-home

Generating a new encryption key...
Wrote the new encryption key to /var/tmp/minifi-home/conf/bootstrap.conf
Encrypted property: nifi.security.client.pass.phrase
Encrypted property: nifi.rest.api.password
Encrypted 2 sensitive properties in /var/tmp/minifi-home/conf/minifi.properties
```

The tool performs the following actions:

1. Generates a new encryption key.
2. Creates a `bootstrap.conf` file in your configuration directory, and write the encryption key to this file.
3. Encrypts the sensitive properties using this encryption key.
4. Adds a `something.protected` encryption marker after each encrypted property.

After running the tool, the bootstrap.conf and minifi.properties files look like as shown in the following examples:

```
bootstrap.conf
nifi.bootstrap.sensitive.key=77cd3f88ab997f7ae99b13c70877c5274c3b7b495f601f
290042b14e7db4d542
```

```
minifi.properties
...
nifi.security.client.pass.phrase=STBmfU0uk5hgSYG503uJM3HeZjrYJz//||vE/V65Qi
MgSatzScaPYkraVrpwnBExVgVX/CwyXx
nifi.security.client.pass.phrase.protected=xsalsa20poly1305
...
nifi.rest.api.user.name=admin
nifi.rest.api.password=q8XNjJMoVABXz7sks506nhaTqqRay4gF||U3762djgMVguHI6GjRl
+iCCDSkIdTFzKDCXi
nifi.rest.api.password.protected=xsalsa20poly1305
...
```

You should protect the bootstrap.conf file to make sure it is only readable by the user who runs MiNiFi.

### Additional sensitive properties

By default, encrypt-config encrypts a (short) list of default sensitive properties. If you want more properties to be encrypted, you can add a nifi.sensitive.props.additional.keys setting with a comma-separated list of additional sensitive properties to your minifi.properties file before running the encrypt-config tool. For example,

```
minifi.properties
...
nifi.sensitive.props.additional.keys=nifi.rest.api.user.name,controller.socket.host,controller.socket.port
...
```

The tool encrypts the additional properties. You can also do this after you have already encrypted some properties. In that case, the tool encrypts the additional properties using the existing encryption key and leaves the other, already encrypted, sensitive properties.

### Modifying sensitive properties

If you later need to modify the value of a sensitive property which was encrypted earlier, perform the following steps:

1. Replace the encrypted value with the new unencrypted value.
2. Delete the something.protected=... line which was added by the tool.
3. Re-run the encrypt-config tool.

The tool encrypts the modified property using the existing encryption key in bootstrap.conf and leaves the other, already encrypted, sensitive properties.

### Encryption of the flow definition

Pass the flag --encrypt-flow-config to encrypt-config so that it also encrypts the flow configuration file, not just the sensitive properties.

### Updating the encryption key

If you want to change the encryption key, perform the following steps:

1. If the files are already encrypted, there should be a nifi.bootstrap.sensitive.key=... line in the bootstrap.conf file (that is, have access to the original key), otherwise you have to manually replace all encrypted data (sensitive properties and flow configuration) with their original unencrypted values (or some other new value).

2. If present, rename the `nifi.bootstrap.sensitive.key=...` property in `bootstrap.conf` to `nifi.bootstrap.sensitive.key.old=...` (that is, add `.old` suffix to the property name).
3. If you have a specific encryption key you would like to use, add it to the `bootstrap.conf` file (add the line `nifi.bootstrap.sensitive.key=<your encryption key here>`). If you provide no encryption key (no `nifi.bootstrap.sensitive.key` property in `bootstrap.conf`, or no `bootstrap.conf` at all), a new key is randomly generated and written to `bootstrap.conf`.
4. Re-run the `encrypt-config` tool.

Take special care when changing the encryption key and the flow configuration is encrypted, so that you also re-encrypt it before deleting the old key (you get a warning if you do not request its re-encryption).

```
$ cat /var/tmp/minifi-home/conf/bootstrap.conf

nifi.bootstrap.sensitive.key.old=0728061a041edb09445ae4dbd95f11bd255bb0b467
b8efb239e665aea5ace46b
nifi.bootstrap.sensitive.key=46af2c11a3f24c8c875ab4bee65e18a75f825fc3a4e0
3abdc8ce49d405b0b730

$ ./bin/encrypt-config --minifi-home /var/tmp/minifi-home

Old encryption key found in conf/bootstrap.conf
Using the existing encryption key found in conf/bootstrap.conf
Successfully decrypted property "nifi.security.client.pass.phrase" using old
key.
Encrypted property: nifi.security.client.pass.phrase
Encrypted 1 sensitive property in conf/minifi.properties
WARNING: you did not request the flow config to be updated, if it is curre
ntly encrypted and the old key is removed, you won't be able to recover the
flow config.
```

If you forgot to specify the `--encrypt-flow-config` flag, you can re-run `encrypt-config` with the flag, and it re-encrypts the flow configuration file, as well.

It is always safe to re-run `encrypt-config`. If it does not find anything new to encrypt, it does not do anything.

When you have successfully re-encrypted all sensitive properties and the flow configuration file(s), you can delete the `nifi.bootstrap.sensitive.key.old` line from the bootstrap file.

### Automatic encryption

Specify the property `nifi.flow.configuration.encrypt=true`, in the properties file to have the new flow configuration written to the disk encrypted after a flow update (originating from a C2 server). It requires that you have a `conf/bootstrap.conf` in your minifi home, containing an encryption key (`nifi.bootstrap.sensitive.key`). This master key is also used on agent startup to decrypt the flow configuration file.

## Integrating with the Windows certificate store

Learn how to enable MiNiFi C++ to get certificates from truststore of the OS.

If you want MiNiFi to communicate with EFM (C2) securely using HTTPS, you need a server certificate that EFM uses to identify itself and a client certificate that MiNiFi uses to identify itself, as well as a private key corresponding to the client certificate.

Manual setup of the client and server certificates on the MiNiFi side:

```
nifi.remote.input.secure=true
nifi.security.need.ClientAuth=true
nifi.security.client.certificate=C:\opt\nifi\data\ssl\client-certificate.pem
nifi.security.client.private.key=C:\opt\nifi\data\ssl\client-certificate.key
#nifi.security.client.pass.phrase=
```

```
nifi.security.client.ca.certificate=C:\opt\nifi\data\ssl\server-certificate.pem
#nifi.security.use.system.cert.store=
```

If both client and server certificates are in the LocalMachine (= "Local Computer") system certificate store (in MY = "Personal" and ROOT = "Trusted Root Certification Authorities", respectively), then you can simply do:

```
nifi.remote.input.secure=true
nifi.security.need.ClientAuth=true
#nifi.security.client.certificate=
#nifi.security.client.private.key=
#nifi.security.client.pass.phrase=
#nifi.security.client.ca.certificate=
nifi.security.use.system.cert.store=true
```

Ensure that the client certificate is exportable.

If you need to select the client certificate by CN, you can add the following property:

```
nifi.security.windows.client.cert.cn=<myCertificateIssuedToName>
```

If you need to select the client certificate by Extended (= "Enhanced") Key Usage, you can add the following property:

```
nifi.security.windows.client.cert.key.usage=Client Authentication, Server Authentication
```

You can also use a different system store location or a different system store for the client and server certificates, if needed:

```
# instead of LocalMachine
nifi.security.windows.cert.store.location=CurrentUser
# instead of MY
nifi.security.windows.client.cert.store=TrustedPeople

# instead of ROOT
nifi.security.windows.server.cert.store=TrustedPublisher
```

## Starting MiNiFi agent

After MiNiFi is installed and configured, you can start it. Learn how to start your MiNiFi agent.

### Procedure

1. From a terminal window, navigate to the MiNiFi installation directory.
2. To start MiNiFi in the foreground, enter:

```
bin/minifi.sh run
```

3. To start MiNiFi in the background, enter:

```
bin/minifi.sh start
```

## Troubleshooting MiNiFi C++ agent

You might need to perform extra configuration steps for the MiNiFi C++ agent.

If you are using CENTOS7 operating system, you might get the following error when you run the agent:

```
PID 15860 is stale, removing pid file at /grid/0/cloudera_flow_management/cpp-minifi/bin/.minifi.pid

Starting MiNiFi with PID 10075 and pid file /grid/0/cloudera_flow_management/cpp-minifi/bin/.minifi.pid

-bash-4.2$ [2019-07-inf01 14:36:04.369] [main] [info] Using MINIFI_HOME=/grid/0/cloudera_flow_management/cpp-minifi from environment.

[2019-07-inf01 14:36:04.369] [org::apache::nifi::minifi::Properties] [info] Using configuration file located at /grid/0/cloudera_flow_management/cpp-minifi/conf/minifi-log.properties, from ./conf/minifi-log.properties
setting default dir to /grid/0/cloudera_flow_management/cpp-minifi/content_repository

Could not find platform independent libraries <prefix>

Could not find platform dependent libraries <exec_prefix>

Consider setting $PYTHONHOME to <prefix>[:<exec_prefix>]
Fatal Python error: Py_Initialize: Unable to get the locale encoding

ImportError: No module named 'encodings'
```

The error occurs when you use an incorrect path for Python. To troubleshoot, update the following property values:

- PYTHONHOME=/usr
- PYTHONPATH=/usr/lib64/python3.4