
KSConf Documentation

Release 0.5.2

Lowell Alleman

Aug 14, 2018

Contents:

1	Intro	1
2	Install	3
2.1	Installation Guide	3
2.2	Command line reference	9
2.3	Developer setup	18
2.4	Contributing back	18
2.5	Changelog	19
2.6	License	22
3	Indices and tables	27

CHAPTER 1

Intro

This utility handles a number of common Splunk app maintenance tasks in an installable python package. Specifically, this tool deals with many of the nuances with storing Splunk apps in a version control system like git and pointing live Splunk apps to a working tree, merging changes from the live system's (local) folder to the version controlled (default) folder, and dealing with more than one layer of "default" (which splunk can't handle natively).


```
pip install kintyre-splunk-conf
```

2.1 Installation Guide

The following doc describes installation options for Kintyre's Splunk Configuration tool. This tool is available as a normal Python package that should require very minimal effort to install and upgrade. However, sometimes Python packaging gets ugly and the one-liner may not work.

A portion of this document is targeted at those who can't install packages as Admin or are forced to use Splunk's embedded Python. For everyone else, please start with the one-liner!

2.1.1 Quick install

Using pip:

```
pip install kintyre-splunk-conf
```

System-level install: (For Mac/Linux)

```
curl https://bootstrap.pypa.io/get-pip.py | sudo python - kintyre-splunk-conf
```

Note: This will also install/update pip and work around some known TLS/SSL issues

Enable Bash completion

If you're on a Mac or Linux, and would like to enable bash completion, run these commands:

```
pip install argcomplete
echo 'eval "$$(register-python-argcomplete ksconf) "' >> ~/.bashrc
```

2.1.2 Requirements

- Python Supports Python 2.7, 3.4+
- PIP (strongly recommended)
- Tested on Mac, Linux, and Windows

Check Python version

Check your installed python version by running:

```
python --version
```

Note that Linux distributions and Mac OS X that ship with multiple version of Python may have renamed this to `python2`, `python2.7` or similar.

Check PIP Version

```
pip --version
```

If you are running a different python interpreter version, you can instead run this as:

```
python2.7 -m pip --version
```

2.1.3 Installation

There are several ways to install `ksconf`. Technically all standard python packaging approaches should work just fine, there's no compiled code or external run-time dependencies so installation is fairly easy, but for non-python developers there are some gotchas. Installation options are listed from the most easy and recommended to more obscure and difficult:

Install from PyPI with PIP

The preferred installation method is to install via the standard Python package tool 'pip'. `Ksconf` can be installed via the registered `kintyre-splunk-conf` package using the standard python process.

There are 2 popular variations, depending on whether or not you would like to install for all users or just play around with it locally.

Install `ksconf` into a virtual environment

Use this option if you don't have admin access

Installing `ksconf` with `virtualenv` is a great way to test the tool without requiring admin privileges and has many advantages for a production install too. Here are the basic steps to get started.

Please change `venv` to a suitable path for your environment.


```
# Install Python virtualenv package (if not already installed)
pip install virtualenv

# Create and activate new 'venv' virtual environment
virtualenv venv
source venv/bin/activate

pip install kintyre-splunk-conf
```

Windows users: The above virtual environment activation should be run as `venv\Scripts\activate.bat`.

Install ksconf system-wide

Note: *This requires admin access.*

This is the absolute easiest install method where ‘ksconf’ is available to all users on the system but it requires root access.

On Mac or Linux, run:

```
sudo pip install kintyre-splunk-conf
```

On Windows, run this commands from an Administrator console.

```
pip install kintyre-splunk-conf
```

Install from GIT

If you’d like to contribute to ksconf, or just build the latest and greatest, then install from the git repository is a good choice. (Technically this is still installing with `pip`, so it’s easy to switch between a PyPI install, and a local install.)

```
git clone https://github.com/Kintyre/ksconf.git
cd ksconf
pip install .
```

See [developer docs](#) for additional details about contributing to ksconf.

2.1.4 Use the standalone executable

Ksconf can be installed as a standalone executable zip app. This approach still requires a python interpreter to be present either from the OS or the one embedded with Splunk Enterprise. This works well for testing or when all other options fail.

From the [GitHub releases](#) page, grab the file name `ksconf-*.pyz`, download it, copy it to a bin folder in your PATH and rename it `ksconf`. The default shebang looks for ‘python’ in the PATH, but this can be adjusted as needed. Since installing with Splunk is a common use case, a second file named `ksconf-*-splunk.pyz` already has the shebang set for the standard `/opt/splunk` install path.

Typical embedded Splunk install example:

```
VER=0.5.0
curl https://github.com/Kintyre/ksconf/releases/download/v${VER}/ksconf-${VER}-splunk.
↪pyz
mv ksconf-${VER}-splunk.pyz /opt/splunk/bin/
```

(continues on next page)

(continued from previous page)

```
cd /opt/splunk/bin
ln -sf ksconf-${VER}-splunk.pyz ksconf
chmod +x ksconf
ksconf --version
```

Reasons why this is a non-ideal install approach:

- Lower performance since all python files live in a zip file, and precompiled version's can be cached.
- No standard install pathway (doesn't use pip); user must manually copy the executable into place.
- Uses a non-standard build process. (May not be a big deal, but could cause things to break in the future.)

Install the Wheel manually (offline mode)

Download the latest “Wheel” file from [PyPI](#), copy it to the destination server and install with pip.

Offline pip install:

```
pip install ~/Downloads/kintyre-splunk-conf-0.4.2-py2.py3-none-any.whl
```

Install with Splunk's Python

Splunk Enterprise 6.x and later installs an embedded Python 2.7 environment. However, Splunk does not provide packing tools (such as `pip` or the `distutils` standard library which is required to bootstrap install `pip`). For these reasons, it's typically easier and cleaner to install `ksconf` with the system provided Python. However, sometimes the system-provided Python environment is the wrong version, is missing (like on Windows), or security restrictions prevent the installation of additional packages. In such cases, Splunk's embedded Python becomes a beacon of hope.

On Linux or Mac

Download the latest “Wheel” file from [PyPI](#). The path to this download will be set in the `pkg` variable as shown below.

Setup the shell:

```
export SPLUNK_HOME=/opt/splunk
export pkg=~Downloads/kintyre_splunk_conf-0.4.9-py2.py3-none-any.whl
```

Run the following:

```
cd $SPLUNK_HOME
mkdir Kintyre
cd Kintyre
# Unzip the 'kconf' folder into SPLUNK_HOME/Kintyre
unzip "$pkg"

cat > $SPLUNK_HOME/bin/ksconf <<HERE
#!/bin/sh
export PYTHONPATH=$PYTHONPATH:$SPLUNK_HOME/Kintyre
exec $SPLUNK_HOME/bin/python -m ksconf \$*
HERE
chmod +x $SPLUNK_HOME/bin/ksconf
```

Test the install:

```
ksconf --version
```

On Windows

1. Open a browser and download the latest “Wheel” file from [PyPI](#).
2. Rename the `.whl` extension to `.zip`. (This may require showing file extensions in Explorer.)
3. Extract the zip file to a temporary folder. (This should create a folder named “ksconf”)
4. Create a new folder called “Kintyre” under the Splunk installation path (aka `SPLUNK_HOME`) By default this is `C:\Program Files\Splunk`.
5. Copy the “ksconf” folder to “`SPLUNK_HOME\Kintyre`”.
6. Create a new batch file called `ksconf.bat` and paste in the following. Be sure to adjust for a non-standard `%SPLUNK_HOME%` value, if necessary.

```
@echo off
SET SPLUNK_HOME=C:\Program Files\Splunk
SET PYTHONPATH=%SPLUNK_HOME%\bin;%SPLUNK_HOME%\Python-2.7\Lib\site-packages\win32;
↪%SPLUNK_HOME%\Python-2.7\Lib\site-packages;%SPLUNK_HOME%\Python-2.7\Lib
SET PYTHONPATH=%PYTHONPATH%;%SPLUNK_HOME%\Kintyre
CALL "%SPLUNK_HOME%\bin\python.exe" -m ksconf %*
```

7. Move `ksconf.bat` to the `Splunk\bin` folder. (This assumes that `%SPLUNK_HOME%/bin` is part of your `%PATH%`. If not, add it, or find an appropriate install location.)
8. Test this by running `ksconf --version` from the command line.

2.1.5 Validate the install

Confirm installation with the following command:

```
ksconf --help
```

If this works, it means that `ksconf` installed and is part of your `PATH` and should be useable everywhere in your system. Go forth and conquer!

2.1.6 Command line completion

Bash completion allows for a more intuitive interactive workflow by providing quick access to command line options and file completions. Often this saves time since the user can avoid mistyping file names or be reminded of which command line actions and arguments are available without switching contexts. For example, if the user types `ksconf d` and hits `then` the `ksconf diff` is completed. Or if the user types `ksconf` and hits `tab` twice, the full list of command actions are listed.

This feature is use the `argcomplete` python package and supports Bash, zsh, tcsh.

Install via pip:

```
pip install argcomplete
```

Enable command line completion for `ksconf` can be done in two ways. The easiest option is to enable it for `ksconf` only. (However, it only works for the current user, it can break if the `ksconf` command is referenced in a non-standard way.)

The alternate option is to enable global command line completion for all python scripts at once, which is preferable if you use this module with many python tool.

Enable argcomplete for ksconf only:

```
# Edit your bashrc script
vim ~/.bashrc

# Add the following line
eval "$(register-python-argcomplete ksconf)"

# Reload your bashrc (Alternative: restart your shell)
source ~/.bashrc
```

To enable argcomplete globally, run the command:

```
activate-global-python-argcomplete
```

This adds new script to your the `bash_completion.d` folder, which can be use for all scripts and all users, but it does add some minor overhead to each completion command request.

OS-specific notes:

- **Mac OS X:** The global registration option has issue due the old version of Bash shipped by default. So either use the one-shot registration or install a later version of bash with homebrew: `brew install bash` then. Switch to the newer bash by default with `chsh /usr/local/bin/bash`.
- **Windows:** Argcomplete doesn't work on windows Bash for GIT. See [argcomplete issue 142](#) for more info. If you really want this, use Linux subsystem for Windows instead.

2.1.7 Frequent gotchas

PIP Install TLS Error

If pip throws an error message like the following:

```
There was a problem confirming the ssl certificate: [SSL: TLSV1_ALERT_PROTOCOL_
↪VERSION] tlsv1 alert protocol version
...
No matching distribution found for setuptools
```

The problem is likely caused by changes to PyPI website in April 2018 when support for TLS v1.0 and 1.1 were removed. Downloading new packages requires upgrading to a new version of pip. Like so:

Upgrade pip as follows:

```
curl https://bootstrap.pypa.io/get-pip.py | python
```

Note: Use `sudo python` above if not in a virtual environment.

Helpful links:

- [Not able to install Python packages \[SSL: TLSV1_ALERT_PROTOCOL_VERSION\]](#)
- [‘pip install’ fails for every package \(“Could not find a version that satisfies the requirement”\)](#)

2.1.8 Resources

- [Python packaging](#) docs provide a general overview on installing Python packages, how to install per-user vs install system-wide.
- [Install PIP](#) docs explain how to bootstrap or upgrade `pip` the Python packaging tool. Recent versions of Python come with this by default, but releases before Python 2.7.9 do not.

2.2 Command line reference

The following documents the CLI options

2.2.1 ksconf

```
usage: ksconf [-h] [--version] [--force-color]
             {check,combine,diff,promote,merge,minimize,sort,unarchive} ...

Ksconf: Kintyre Splunk CONFIG tool

This utility handles a number of common Splunk app maintenance tasks in a small
and easy to deploy package. Specifically, this tools deals with many of the
nuances with storing Splunk apps in git, and pointing live Splunk apps to a git
repository. Merging changes from the live system's (local) folder to the
version controlled (default) folder, and dealing with more than one layer of
"default" (which splunk can't handle natively) are all supported tasks.

positional arguments:
  {check,combine,diff,promote,merge,minimize,sort,unarchive}
  check                Perform basic syntax and sanity checks on .conf files
  combine              Combine configuration files across multiple source
                     directories into a single destination directory. This
                     allows for an arbitrary number of splunk configuration
                     layers to coexist within a single app. Useful in both
                     ongoing merge and one-time ad-hoc use. For example,
                     combine can consolidate 'users' directory across
                     several instances after a phased server migration.
  diff                Compare settings differences between two .conf files
                     ignoring spacing and sort order
  promote             Promote .conf settings from one file into another
                     either in batch mode (all changes) or interactively
                     allowing the user to pick which stanzas and keys to
                     integrate. Changes made via the UI (stored in the
                     local folder) can be promoted (moved) to a version-
                     controlled directory.
  merge              Merge two or more .conf files
  minimize           Minimize the target file by removing entries
                     duplicated in the default conf(s)
  sort               Sort a Splunk .conf file creating a normalized format
                     appropriate for version control
  unarchive          Install or upgrade an existing app in a git-friendly
                     and safe way

optional arguments:
  -h, --help        show this help message and exit
```

(continues on next page)

(continued from previous page)

<code>--version</code>	show program's version number and exit
<code>--force-color</code>	Force TTY color mode on. Useful if piping the output a color-aware pager, like <code>'less -R'</code>

2.2.2 kscnf check

```
usage: kscnf check [-h] [--quiet] FILE [FILE ...]
```

Provide basic syntax **and** sanity checking **for** Splunk's `.conf` files. Use Splunk's builtin `'btool check'` for a more robust validation of keys and values. Consider using this utility **as** part of a pre-commit hook.

positional arguments:

FILE One **or** more configuration files to check. If `'-'` **is** given, then read a **list** of files to validate **from standard** input

optional arguments:

`-h, --help` show this help message **and** exit
`--quiet, -q` Reduce the volume of output.

2.2.3 kscnf combine

```
usage: kscnf combine [-h] [--target TARGET] [--dry-run] [--banner BANNER]
                 source [source ...]
```

Merge `.conf` settings from multiple source directories into a combined target directory. Configuration files can be stored in a `'/etc/*.d'` like directory structure and consolidated back into a single `'default'` directory.

This command supports both one-time operations and recurring merge jobs. For example, this command can be used to combine all users knowledge objects (stored in `'etc/users'`) after a server migration, or to merge a single user's settings after an their account has been renamed. Recurring operations assume some type of external scheduler is being used. A best-effort is made to only write to target files as needed.

The `'combine'` command takes your logical layers of configs (upstream, corporate, splunk admin fixes, and power user knowledge objects, ...) expressed as individual folders and merges them all back into the single `'default'` folder that Splunk reads from. One way to keep the `'default'` folder up-to-date is using client-side git hooks.

No directory layout is mandatory, but but one simple approach is to model your layers using a prioritized `'default.d'` directory structure. (This idea is borrowed from the Unix System V concept where many services natively read their config files from `'/etc/*.d'` directories.)

THE PROBLEM:

In a typical enterprise deployment of Splunk, a single app can easily have multiple logical sources of configuration: (1) The upstream app developer, (2) local developer app-developer adds organization-specific customizations or

(continues on next page)

(continued from previous page)

fixes, (3) splunk admin tweaks the inappropriate 'indexes.conf' settings, and (4) custom knowledge objects added by your subject matter experts. Ideally we'd like to version control these, but doing so is complicated because normally you have to manage all 4 of these logical layers in one 'default' folder. (Splunk requires that app settings be located either in 'default' or 'local'; and managing local files with version control leads to merge conflicts; so effectively, all version controlled settings need to be in 'default', or risk merge conflicts.) So when a new upstream version is released, someone has to manually upgrade the app being careful to preserve all custom configurations. The solution provided by the 'combine' functionality is that all of these logical sources can be stored separately in their own physical directories allowing changes to be managed independently. (This also allows for different layers to be mixed-and-matched by selectively including which layers to combine.) While this doesn't completely remove the need for a human to review app upgrades, it does lower the overhead enough that updates can be pulled in more frequently, thus reducing the divergence potential. (Merge frequently.)

NOTES:

The 'combine' command is similar to running the 'merge' subcommand recursively against a set of directories. One key difference is that this command will gracefully handle non-conf files intelligently too.

EXAMPLE:

```

Splunk_CiscoSecuritySuite/
├── README
├── default.d
│   ├── 10-upstream
│   │   ├── app.conf
│   │   ├── data
│   │   │   └── ui
│   │   │       ├── nav
│   │   │       │   └── default.xml
│   │   │       └── views
│   │   │           ├── authentication_metrics.xml
│   │   │           ├── cisco_security_overview.xml
│   │   │           ├── getting_started.xml
│   │   │           ├── search_ip_profile.xml
│   │   │           ├── upgrading.xml
│   │   │           └── user_tracking.xml
│   ├── eventtypes.conf
│   ├── macros.conf
│   ├── savedsearches.conf
│   └── transforms.conf
│   ├── 20-my-org
│   │   └── savedsearches.conf
│   ├── 50-splunk-admin
│   │   ├── indexes.conf
│   │   ├── macros.conf
│   │   └── transforms.conf
│   └── 70-firewall-admins
│       ├── data
│       │   └── ui
│       │       └── views
│       │           ├── attacks_noc_bigscreen.xml
│       │           └── device_health.xml

```

(continues on next page)

(continued from previous page)

```

├── user_tracking.xml
└── eventtypes.conf

```

Commands:

```

cd Splunk_CiscoSecuritySuite
ksconf combine default.d/* --target=default

```

positional arguments:

source	The source directory where configuration files will be merged from. When multiple sources directories are provided, start with the most general and end with the specific; later sources will override values from the earlier ones. Supports wildcards so a typical Unix 'conf.d/##-NAME' directory structure works well.
--------	--

optional arguments:

-h, --help	show this help message and exit
--target TARGET, -t TARGET	Directory where the merged files will be stored. Typically either 'default' or 'local'
--dry-run, -D	Enable dry-run mode. Instead of writing to TARGET, preview changes as a 'diff'. If TARGET doesn't exist, then show the merged file.
--banner BANNER, -b BANNER	A warning banner to discourage manual editing of conf files.

2.2.4 ksconf diff

```

usage: ksconf diff [-h] [-o FILE] [--comments] CONF1 CONF2

```

Compares the content differences of two .conf files

This command ignores textual differences (like order, spacing, **and** comments) **and** focuses strictly on comparing stanzas, keys, **and** values. Note that spaces within **any** given value will be compared. Multiline fields are compared **in** are compared **in** a more traditional 'diff' output so that long savedsearches **and** macros can be compared more easily.

positional arguments:

CONF1	Left side of the comparison
CONF2	Right side of the comparison

optional arguments:

-h, --help	show this help message and exit
-o FILE, --output FILE	File where difference is stored. Defaults to standard out.
--comments, -C	Enable comparison of comments. (Unlikely to work consistently)

2.2.5 ksconf promote

```
usage: ksconf promote [-h] [--batch | --interactive] [--force] [--keep]
                        [--keep-empty]
                        SOURCE TARGET
```

Propagate .conf settings applied **in** one file to another. Typically this **is** used to take local changes made via the UI **and** push them into a default (**or** default.d/) location.

NOTICE: By default, changes are ***MOVED***, **not** just copied.

Promote has two different modes: **batch** **and** **interactive**. In **batch** mode **all** changes are applied automatically **and** the (now empty) source file **is** removed. In **interactive** mode the user **is** prompted to pick which stanzas **and** keys to integrate. This can be used to push changes made via the UI, which are stored **in** a 'local' file, to the version-controlled 'default' file. Note that the normal operation moves changes **from the** SOURCE file to the TARGET, updating both files **in** the process. But it's **also possible to preserve the local file, if** desired.

If either the source file **or** target file **is** modified **while** a promotion **is** under progress, changes will be aborted. And any custom selections you made will be lost. (This needs improvement.)

positional arguments:

SOURCE	The source configuration file to pull changes from. (Typically the 'local' conf file)
TARGET	Configuration file or directory to push the changes into. (Typically the 'default' folder) As a shortcut, a directory is given, then it's assumed that the same basename is used for both SOURCE and TARGET. In fact, if different basename as provided, a warning is issued.

optional arguments:

-h, --help	show this help message and exit
--batch, -b	Use batch mode where all configuration settings are automatically promoted. All changes are removed from source and applied to target. The source file will be removed, unless ' --keep-empty ' is used.
--interactive, -i	Enable interactive mode where the user will be prompted to approve the promotion of specific stanzas and keys. The user will be able to apply, skip, or edit the changes being promoted. (This functionality was inspired by 'git add --patch').
--force, -f	Disable safety checks.
--keep, -k	Keep conf settings in the source file. All changes will be copied into the target file instead of being moved there. This is typically a bad idea since local always overrides default.
--keep-empty	Keep the source file, even if after the settings promotions the file has no content. By default, SOURCE will be removed after all content has been moved into TARGET. Splunk will re-create any necessary local files on the fly.

2.2.6 kskonf merge

```
usage: kskonf merge [-h] [--target FILE] [--dry-run] [--banner BANNER]
                FILE [FILE ...]
```

Merge two **or** more .conf files into a single combined .conf file. This could be used to merge the props.conf file **from ALL** technology addons into a single file:

```
kskonf merge --target=all-ta-props.conf etc/apps/*TA*/{default,local}/props.conf
```

positional arguments:

FILE The source configuration file to pull changes from.

optional arguments:

-h, --help show this help message **and** exit

--target FILE, -t FILE Save the merged configuration files to this target file. If **not** provided, the the merged conf **is** written to standard output.

--dry-run, -D Enable dry-run mode. Instead of writing to TARGET, preview changes **in 'diff' format**. If TARGET doesn't exist, then show the merged file.

--banner BANNER, -b BANNER A banner **or** warning comment added to the top of the TARGET file. This **is** often used to warn Splunk admins **from editing** an auto-generated file.

2.2.7 kskonf minimize

```
usage: kskonf minimize [-h] [--target FILE] [--dry-run | --output OUTPUT]
                [--explode-default] [-k PRESERVE_KEY]
                FILE [FILE ...]
```

Minimize a conf file by removing the default settings

Reduce local conf file to only your indented changes without manually tracking which entires you've edited. **Minimizing local conf files makes your local customizations easier to read and** often results **in** cleaner add-on upgrades.

A typical scenario & why does this matter:

To customizing a Splunk app **or** add-on, start by copying the conf file **from default** to local **and** then applying your changes to the local file. That's good. But stopping here may complicated future upgrades, because the local file doesn't contain ***just* your settings, it contains all the default settings too**. Fixes published by the app creator may be masked by your local settings. A better approach **is** to reduce the local conf file leaving only the stanzas **and** settings that you indented to change. This make your conf files easier to read **and** makes upgrades easier, but it's tedious to do by hand.

For special cases, the '--explode-default' mode reduces duplication between entries normal stanzas **and global/default** entries. If '**disabled = 0**' **is a global default**, it's **technically safe to remove that setting from individual stanzas**. But sometimes it's preferable to be explicit, and this behavior may be too heavy-handed **for** general use so it's off by default. Use this mode if your

(continues on next page)

(continued from previous page)

conf file that's been fully-expanded. (i.e., conf entries downloaded via REST, or the output of "btool list"). This isn't perfect, since many apps push their settings into the **global** namespace, but it can help.

Example usage:

```
cd Splunk_TA_nix
cp default/inputs.conf local/inputs.conf

# Edit 'disabled' and 'interval' settings in-place
vi local/inputs.conf

# Remove all the extra (unmodified) bits
ksconf minimize --target=local/inputs.conf default/inputs.conf
```

positional arguments:

FILE The default configuration file(s) used to determine what base settings are "unnecessary to keep in the target file.

optional arguments:

-h, --help show this help message **and** exit

--target FILE, -t FILE This **is** the local file that you **with** to remove the duplicate settings from. By default, this file will be read **and** the updated **with** a minimized version.

--dry-run, -D Enable dry-run mode. Instead of writing the minimizing the TARGET file, preview what what be removed **in** the form of a 'diff'.

--output OUTPUT Write the minimized output to a separate file instead of updating TARGET. This can be use to preview changes **if** dry-run produces a large diff. This may also be helpful **in** other workflows.

--explode-default, -E Enable minimization across stanzas **as** well **as** files **for** special use-cases. This mode will **not** only minimize the same stanza across multiple config files, it will also attempt to minimize default **any** values stored **in** the [default] **or** **global** stanza **as** well. Example: Trim out cruft **in** savedsearches.conf by pointing to etc/system/default/savedsearches.conf

-k PRESERVE_KEY, --preserve-key PRESERVE_KEY Specify a key that should be allowed to be a duplication but should be preserved within the minimized output. For example, it may be esirable keep the 'disabled' settings **in** the local file, even **if** it's enabled by default.

2.2.8 ksconf sort

```
usage: ksconf sort [-h] [--target FILE | --inplace] [-F] [-q] [-n LINES]
           FILE [FILE ...]
```

Sort a Splunk .conf file. Sort has two modes: (1) by default, the **sorted** config file will be echoed to the screen. (2) the config files are updated

(continues on next page)

(continued from previous page)

inplace when the `-i` option **is** used.

Manually managed conf files can be blacklisted by add a comment containing the string `'KSCONF-NO-SORT'` to the top of *any* .conf file.

To recursively sort **all** files:

```
find . -name '*.conf' | xargs kscnf sort -i
```

positional arguments:

FILE Input file to sort, **or** standard input.

optional arguments:

`-h, --help` show this help message **and** exit
`--target FILE, -t FILE` File to write results to. Defaults to standard output.
`--inplace, -i` Replace the **input** file **with** a **sorted** version. **Warning** this a potentially destructive operation that may move/remove comments.
`-n LINES, --newlines LINES` Lines between stanzas.

In-place update arguments:

`-F, --force` Force file sorting **for** all files, even **for** files containing the special `'KSCONF-NO-SORT'` marker.
`-q, --quiet` Reduce the output. Reports only updated **or** invalid files. This **is** useful **for** pre-commit hooks, **for** example.

2.2.9 kscnf unarchive

```
usage: kscnf unarchive [-h] [--dest DIR] [--app-name NAME]
                        [--default-dir DIR] [--exclude EXCLUDE] [--keep KEEP]
                        [--allow-local]
                        [--git-sanity-check {off,changed,untracked,ignored}]
                        [--git-mode {nochange,stage,commit}] [--no-edit]
                        [--git-commit-args GIT_COMMIT_ARGS]
                        SPL
```

Install or overwrite an existing app in a git-friendly way.

If the app already exist, steps will be taken to upgrade it safely.

The 'default' folder can be redirected to another path (i.e., `'default.d/10-upstream'` ↪
 ↪or

whatever which is helpful if you're using the kscnf 'combine' mode.)

Supports tarballs (.tar.gz, .spl), and less-common zip files (.zip)

positional arguments:

SPL The path to the archive to install.

optional arguments:

`-h, --help` show this help message and exit
`--dest DIR` Set the destination path where the archive will be extracted. By default the current directory is used,

(continues on next page)

(continued from previous page)

```

but sane values include etc/apps, etc/deployment-apps,
and so on. This could also be a git repository working
tree where splunk apps are stored.
--app-name NAME      The app name to use when expanding the archive. By
                    default, the app name is taken from the archive as the
                    top-level path included in the archive (by
                    convention). Expanding archives that contain multiple
                    (ITSI) or nested apps (NIX, ES) is not supported.)
--default-dir DIR    Name of the directory where the default contents will
                    be stored. This is a useful feature for apps that use
                    a dynamic default directory that's created and managed
                    by the 'combine' mode.
--exclude EXCLUDE, -e EXCLUDE
                    Add a file pattern to exclude. Splunk's pseudo-glob
                    patterns are supported here. '*' for any non-directory
                    match, '...' for ANY (including directories), and '?'
                    for a single character.
--keep KEEP, -k KEEP Specify a pattern for files to preserve during an
                    upgrade. Repeat this argument to keep multiple
                    patterns.
--allow-local        Allow local/ and local.meta files to be extracted from
                    the archive. Shipping local files is a Splunk app
                    packaging violation so local files are blocked to
                    prevent content from being overridden.
--git-sanity-check {off,changed,untracked,ignored}
                    By default 'git status' is run on the destination
                    folder to detect working tree or index modifications
                    before the unarchive process starts, but this is
                    configurable. Sanity check choices go from least
                    restrictive to most thorough: Use 'off' to prevent any
                    'git status' safely checks. Use 'changed' to abort
                    only upon local modifications to files tracked by git.
                    Use 'untracked' (the default) to look for changed and
                    untracked files before considering the tree clean. Use
                    'ignored' to enable the most intense safety check
                    which will abort if local changes, untracked, or
                    ignored files are found. NOTE: Sanity checks are
                    automatically disabled if the app is not in a git
                    working tree, or git is not installed.
--git-mode {nochange,stage,commit}
                    Set the desired level of git integration. The default
                    mode is 'stage', where new, updated, or removed files
                    are automatically handled for you. If 'commit' mode is
                    selected, then files are committed with an auto-
                    generated commit message. To prevent any 'git add' or
                    'git rm' commands from being run, pick the 'nochange'
                    mode. Notes: (1) The git mode is irrelevant if the app
                    is not in a git working tree. (2) If a git commit is
                    incorrect, simply roll it back with 'git reset' or fix
                    it with a 'git commit --amend' before the changes are
                    pushed anywhere else. (That's why you're using git in
                    the first place, right?)
--no-edit            Tell git to skip opening your editor. By default you
                    will be prompted to review/edit the commit message.
                    (Git Tip: Delete the content of the message to abort
                    the commit.)
--git-commit-args GIT_COMMIT_ARGS, -G GIT_COMMIT_ARGS

```

2.3 Developer setup

The following steps highlight the developer install process.

2.3.1 Setup tools

If you are a developer then we strongly suggest installing into a virtual environment to prevent overwriting the production version of `ksconf` and for the installation of the developer tools. (The `virtualenv` name `ksconfdev-pyve` is used below, but this can be whatever suites, just make sure not to commit it. .)

```
# Setup and activate virtual environment
virtualenv ksconfdev-pyve
. ksconfdev-pyve/bin/activate

# Install developer packages
pip install -r requirements-dev.txt
```

2.3.2 Install ksconf

```
git clone https://github.com/Kintyre/ksconf.git
cd ksconf
pip install .
```

2.3.3 Building the docs

```
cd ksconf
. ksconfdev-pyve/bin/activate

cd docs
make html
open build/html/index.html
```

If you'd like to build PDF, then you'll need some extra tools. On Mac, you may also want to install the following (for building docs, and the like):

```
brew install homebrew/cask/mactex-no-gui
```

(Doh! Still doesn't work, instructions are incomplete for mac latex, ...)

2.4 Contributing back

Pull requests are greatly welcome! If you plan on contributing code back to the main `ksconf` repo, please follow the standard GitHub fork and pull-request work-flow. We also ask that you enable a set of git hooks to help safeguard against avoidable issues.

2.4.1 Pre-commit hook

The `ksconf` project uses the `pre-commit` hook to enable the following checks:

- Fixes trailing whitespace, EOF, and EOLs
- Confirms python code compiles (AST)
- Blocks the committing of large files and keys
- Rebuilds the CLI docs. (Eventually to be replaced with an argparse Sphinx extension)
- Confirms that all Unit test pass. (Currently this is the same tests also run by Travis CI, but since test complete in under 5 seconds, the run-everywhere approach seems appropriate for now. Eventually, the local testing will likely become a subset of the full test suite.)

Note that this repo both uses pre-commit for its own validation (as discussed here) and provides a pre-commit hook service to other repos. This way repositories housing Splunk apps can, for example, use 'ksconf -check' or `ksconf --sort` against their own `.conf` files for validation purposes.

Installing the pre-commit hook

To run ensure you changes comply with the ksconf coding standards, please install and activate `pre-commit`.

Install:

```
sudo pip install pre-commit

# Register the pre-commit hooks (one time setup)
cd ksconf
pre-commit install --install-hooks
```

2.4.2 Install gitlint

Gitlint will check to ensure that commit messages are in compliance with the standard subject, empty-line, body format. You can enable it with:

```
gitlint install-hook
```

2.5 Changelog

2.5.1 Ksconf 0.5.x

Add Python 3 support, external command plugins, tox and vagrant for testing.

Release v0.5.1 (2018-06-28)

- Support external ksconf command plugins through custom 'entry_points', allowing for others to develop their own custom extensions as needed.
- Many internal changes: Refactoring of all CLI commands to use new entry_points as well as pave the way for future CLI unittest improvements.
- Docs cleanup / improvements.

Release v0.5.0 (2018-06-26)

- Python 3 support.
- Many bug fixes and improvements resulting from wider testing.

2.5.2 Ksconf 0.4.x

Ksconf 0.4.x switched to a modular code base, added build/release automation, PyPI package registration (installation via `pip install` and, online docs.

Release v0.4.10 (2018-06-26)

- Improve file handling to avoid “unclosed file” warnings. Impacted `parse_conf()`, `write_conf()`, and many unittest helpers.
- Update badges to report on the master branch only. (No need to highlight failures on feature or bug-fix branches.)

Release v0.4.9 (2018-06-05)

- Add some missing docs files

Release v0.4.8 (2018-06-05)

- Massive cleanup of docs: revamped install guide, added ‘standalone’ install procedure and developer-focused docs. Updated license handling.
- Updated docs configuration to dynamically pull in the ksconf version number.
- Using the classic ‘read-the-docs’ Sphinx theme.
- Added additional PyPi badges to README (GitHub home page).

Release v0.4.4-v0.4.1 (2018-06-04)

- Deployment and install fixes (It’s difficult to troubleshoot/test without making a new release!)

Release v0.4.3 (2018-06-04)

- Rename PyPI package `kintyre-splunk-conf`
- Add support for building a standalone executable (zipapp).
- Revamp install docs and location
- Add GitHub release for the standalone executable.

Release v0.4.2 (2018-06-04)

- Add readthedocs.io support

Release v0.4.1 (2018-06-04)

- Enable PyPI production package building

Release v0.4.0 (2018-05-19)

- Refactor entire code base. Switched from monolithic all-in-one file to clean-cut modules.
- Versioning is now discoverable via `ksconf --version`, and controlled via git tags (via `git describe --tags`).

Module layout

- `ksconf.conf.*` - Configuration file parsing, writing, comparing, and so on
- `ksconf.util.*` - Various helper functions
- `ksconf.archive` - Support for uncompressing Splunk apps (tgz/zip files)
- `ksconf.vc.git` - Version control support. Git is the only VC tool supported for now. (Possibly ever)
- `ksconf.commands.<CMD>` - Modules for specific CLI functions. I may make this extendable, eventually.

2.5.3 Ksconf 0.3.x

First public releases.

Release v0.3.2 (2018-04-24)

- Add AppVeyor for Windows platform testing
- Add codecov integration
- Created `ConfFileProxy.dump()`

Release v0.3.1 (2018-04-21)

- Setup automation via Travis CI
- Add code coverage

Release v0.3.0 (2018-04-21)

- Switched to semantic versioning.
- 0.3.0 feels representative of the code maturity.

2.5.4 Ksconf legacy releases

Ksconf started in a private Kintyre repo. There are no official releases; all git history has been rewritten.

Release legacy-v1.0.1 (2018-04-20)

- Fixes to blacklist support and many enhancements to `ksconf unarchive`.
- Introduces parsing profiles.
- Lots of bug fixes to various subcommands.
- Added automatic detection of 'subcommands' for CLI documentation helper script.

Release legacy-v1.0.0 (2018-04-16)

- This is the first public release. First work began Nov 2017 (as a simple conf 'sort' tool, which was imported from yet another repo.) Version history was extracted/rewritten/preserved as much as possible.
- Mostly stable features.
- Unit test coverage over 85%
- Includes pre-commit hook configuration (so that other repos can use this to run `ksconf sort` and `ksconf check` against their conf files.

2.6 License

```
Apache License
Version 2.0, January 2004
http://www.apache.org/licenses/
```

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms **and** conditions **for** use, reproduction, **and** distribution **as** defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner **or** entity authorized by the copyright owner that **is** granting the License.

"Legal Entity" shall mean the union of the acting entity **and** all other entities that control, are controlled by, **or** are under common control **with** that entity. For the purposes of this definition, "control" means (i) the power, direct **or** indirect, to cause the direction **or** management of such entity, whether by contract **or** otherwise, **or** (ii) ownership of fifty percent (50%) **or** more of the outstanding shares, **or** (iii) beneficial ownership of such entity.

"You" (**or** "Your") shall mean an individual **or** Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form **for** making modifications, including but **not** limited to software source code, documentation source, **and** configuration files.

"Object" form shall mean any form resulting **from mechanical** transformation **or** translation of a Source form, including but **not** limited to compiled **object** code, generated documentation,

(continues on next page)

(continued from previous page)

and conversions to other media types.

"Work" shall mean the work of authorship, whether **in** Source **or** Object form, made available under the License, **as** indicated by a copyright notice that **is** included **in or** attached to the work (an example **is** provided **in** the Appendix below).

"Derivative Works" shall mean **any** work, whether **in** Source **or** Object form, that **is** based on (**or** derived from) the Work **and for** which the editorial revisions, annotations, elaborations, **or** other modifications represent, **as** a whole, an original work of authorship. For the purposes of this License, Derivative Works shall **not** include works that remain separable from, **or** merely link (**or** bind by name) to the interfaces of, the Work **and** Derivative Works thereof.

"Contribution" shall mean **any** work of authorship, including the original version of the Work **and any** modifications **or** additions to that Work **or** Derivative Works thereof, that **is** intentionally submitted to Licensor **for** inclusion **in** the Work by the copyright owner **or** by an individual **or** Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means **any** form of electronic, verbal, **or** written communication sent to the Licensor **or** its representatives, including but **not** limited to communication on electronic mailing lists, source code control systems, **and** issue tracking systems that are managed by, **or** on behalf of, the Licensor **for** the purpose of discussing **and** improving the Work, but excluding communication that **is** conspicuously marked **or** otherwise designated **in** writing by the copyright owner **as** "Not a Contribution."

"Contributor" shall mean Licensor **and any** individual **or** Legal Entity on behalf of whom a Contribution has been received by Licensor **and** subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms **and** conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, **and** distribute the Work **and** such Derivative Works **in** Source **or** Object form.
3. Grant of Patent License. Subject to the terms **and** conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (**except as** stated **in** this section) patent license to make, have made, use, offer to sell, sell, import, **and** otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone **or** by combination of their Contribution(s) **with** the Work to which such Contribution(s) was submitted. If You institute patent litigation against **any** entity (including a cross-claim **or** counterclaim **in** a lawsuit) alleging that the Work **or** a Contribution incorporated within the Work constitutes direct **or** contributory patent infringement, then **any** patent licenses granted to You under this License **for** that Work shall terminate **as** of the date such litigation **is** filed.
4. Redistribution. You may reproduce **and** distribute copies of the

(continues on next page)

(continued from previous page)

Work **or** Derivative Works thereof **in** any medium, **with or** without modifications, **and in** Source **or** Object form, provided that You meet the following conditions:

- (a) You must give **any** other recipients of the Work **or** Derivative Works a copy of this License; **and**
- (b) You must cause **any** modified files to carry prominent notices stating that You changed the files; **and**
- (c) You must retain, **in** the Source form of **any** Derivative Works that You distribute, **all** copyright, patent, trademark, **and** attribution notices **from the** Source form of the Work, excluding those notices that do **not** pertain to **any** part of the Derivative Works; **and**
- (d) If the Work includes a "NOTICE" text file **as** part of its distribution, then **any** Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do **not** pertain to **any** part of the Derivative Works, **in** at least one of the following places: within a NOTICE text file distributed **as** part of the Derivative Works; within the Source form **or** documentation, **if** provided along **with** the Derivative Works; **or**, within a display generated by the Derivative Works, **if and** wherever such third-party notices normally appear. The contents of the NOTICE file are **for** informational purposes only **and** do **not** modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside **or as** an addendum to the NOTICE text **from the** Work, provided that such additional attribution notices cannot be construed **as** modifying the License.

You may add Your own copyright statement to Your modifications **and** may provide additional **or** different license terms **and** conditions **for** use, reproduction, **or** distribution of Your modifications, **or for any** such Derivative Works **as** a whole, provided Your use, reproduction, **and** distribution of the Work otherwise complies **with** the conditions stated **in** this License.

5. Submission of Contributions. Unless You explicitly state otherwise, **any** Contribution intentionally submitted **for** inclusion **in** the Work by You to the Licensor shall be under the terms **and** conditions of this License, without **any** additional terms **or** conditions. Notwithstanding the above, nothing herein shall supersede **or** modify the terms of **any** separate license agreement you may have executed **with** Licensor regarding such Contributions.
6. Trademarks. This License does **not** grant permission to use the trade names, trademarks, service marks, **or** product names of the Licensor, **except as** required **for** reasonable **and** customary use **in** describing the origin of the Work **and** reproducing the content of the NOTICE file.
7. Disclaimer of Warranty. Unless required by applicable law **or** agreed to **in** writing, Licensor provides the Work (**and** each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express **or**

(continues on next page)

(continued from previous page)

implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

Copyright 2018 Kintyre

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

CHAPTER 3

Indices and tables

- `genindex`
- `modindex`
- `search`