

Ansible Hackathon 2021 Contribution: Improved idempotency - zypper_repository

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Parallel to the [Ansible Contributor Summit 2021.09](#) and the [Ansible Fest 2021](#) there was a **Hackathon** with focus on first time Contributor. Even though I use Ansible since years, but mainly from a User perspective (Playbooks, Roles, Collections), I wasn't officially Contributing to a Plugin or Module yet.

I did some smaller bugfixing or improvements in the past, but mainly for myself or a very unique use case at work. So far I never worked on one of the GitHub Issues or created a PR for any of the [community modules](#), something I always wanted to change.

As already mentioned a [few days ago](#), I started putting all my configs in Ansible Playbook(s). I'm using openSUSE Tumbleweed with some additional repositories and wanted to managed them also via Ansible. I prefer `.repo` files, they are very convinient, you don't have to manage anything manually. There is a Module available (`community.general.zypper_repository`) but there was a [bug](#) regarding the idempotency when using `.repo` files.

You could add a new repository by using a `.repo` file but then every future run will fail, also removing a repository the same way wasn't working either.

So I decided to work on this Issue during the Hackathon and get some Hands-On Experience contributing to Ansible Collections.

Due to the fact that you need at least a `name` and `baseurl` to identify if something need to be added, changed or removed, I decided to download the `.repo` file, parse it and work with the actual values. The previous Implementation was calling `zypper` more or less directly with the URL to the file as Parameter, which caused the reported issues.

Now the **community.general.zypper_repository** module supports `.repo` files via URL or from a local path, behave as expected in regards to idempotency and is fully covered by integration tests.

There were always [Ansible Community.General Maintainer](#) available via Matrix to answer questions, pointing into the right direction and assisting in case of any problems.

It was a great experience for me! I can just recommend such Events, I've learned a lot during these two days and finished my [Pull Request](#), which also fixes a [second issue](#).

All CI tests are finally passed, feedback from the first Reviewer is positive, fingers crossed everything will be fine and the PR merged soon :)

I will write a little more about the Summit, my experiences and things learned or found useful, to get started contributing, within the next days in a separate post.

Even though you can find all details in my [Pull Request on GitHub](#), I don't want to force navigating to a different site, so let me share the *diff* (at time of writing) here as well:

```

diff --git a/changelogs/fragments/3474-zyper_repository_improve_repo_file_idempotency.yml b/changelogs/fragments/3474-zyper_repository_improve_repo_file_idempotency.yml
new file mode 100644
index 0000000000..4f3b56329cb
--- /dev/null
+++ b/changelogs/fragments/3474-zyper_repository_improve_repo_file_idempotency.yml
@@ -0,0 +1,7 @@
+bugfixes:
+ - zyper_repository = when an URL to a .repo file was provided in option
+   ``repo`` and ``state=present`` only the first run was successful,
+   future runs failed due to missing checks prior starting zyper.
+ Usage of ``state=absent`` in combination with a .repo file was not
+ working either (https://github.com/ansible-collections/community.general/issues/1791,
+ https://github.com/ansible-collections/community.general/issues/3466).

diff --git a/plugins/modules/packaging/os/zypper_repository.py b/plugins/modules/packaging/os/zypper_repository.py
index 38aeb618e8..a29650a17ef 100644
--- a/plugins/modules/packaging/os/zypper_repository.py
+++ b/plugins/modules/packaging/os/zypper_repository.py
@@ -137,6 +137,10 @@
from ansible.module_utils.basic import AnsibleModule, missing_required_lib
+from ansible.module_utils.urls import fetch_url
+from ansible.module_utils.common.text.converters import to_text
+from ansible.module_utils.six.moves import configparser, StringIO
+from io import open

REPO_OPTS = ['alias', 'name', 'priority', 'enabled', 'autorefresh', 'gpgcheck']
@@ -382,12 +386,62 @@ def exit_unchanged():
    if not alias and state == "present":
        module.fail_json(msg='Name required when adding non-repo files.')

+
+ # Download / Open and parse .repo file to ensure idempotency
+ if repo and repo.endswith('.repo'):
+     if repo.startswith(('http://', 'https://')):
+         response, info = fetch_url(module=module, url=repo, force=True)
+         if not response or info['status'] != 200:
+             module.fail_json(msg='Error downloading .repo file from provided URL')
+         repofile_text = to_text(response.read(), errors='surrogate_or_strict')
+     else:
+         try:
+             with open(repo, encoding='utf-8') as file:
+                 repofile_text = file.read()
+         except IOError:
+             module.fail_json(msg='Error opening .repo file from provided path')
+
+     repofile = configparser.ConfigParser()
+     try:
+         repofile.readfp(StringIO(repofile_text))
+     except configparser.Error:
+         module.fail_json(msg='Invalid format, .repo file could not be parsed')
+
+     # No support for .repo file with zero or more than one repository
+     if len(repofile.sections()) != 1:
+         err = "Invalid format, .repo file contains %s repositories, expected 1" % len(repofile.sections())
+
    module.fail_json(msg=err)

    section = repofile.sections()[0]
    repofile_items = dict(repofile.items(section))
    # Only proceed if at least baseurl is available
    if 'baseurl' not in repofile_items:
        module.fail_json(msg='No baseurl found in .repo file')

    # Set alias (name) and url based on values from .repo file
    alias = section
    repodata['alias'] = section
    repodata['url'] = repofile_items['baseurl']

    # If gpgkey is part of the .repo file, auto import key
    if 'gpgkey' in repofile_items:
        auto_import_keys = True

    # Map additional values, if available
    if 'name' in repofile_items:
        repodata['name'] = repofile_items['name']
    if 'enabled' in repofile_items:
        repodata['enabled'] = repofile_items['enabled']
    if 'autorefresh' in repofile_items:
        repodata['autorefresh'] = repofile_items['autorefresh']
    if 'gpgcheck' in repofile_items:
        repodata['gpgcheck'] = repofile_items['gpgcheck']

    exists, mod, old_repos = repo_exists(module, repodata, overwrite_multiple)

- if repo:
-     shortname = repo

- else:
+ if alias:
+     shortname = alias
+ else:
+     shortname = repo

    if state == 'present':
        if exists and not mod:

```

```

    module.fail_json(msg=err)

    section = repofile.sections()[0]
    repofile_items = dict(repofile.items(section))
    # Only proceed if at least baseurl is available
    if 'baseurl' not in repofile_items:
        module.fail_json(msg='No baseurl found in .repo file')

    # Set alias (name) and url based on values from .repo file
    alias = section
    repodata['alias'] = section
    repodata['url'] = repofile_items['baseurl']

    # If gpgkey is part of the .repo file, auto import key
    if 'gpgkey' in repofile_items:
        auto_import_keys = True

    # Map additional values, if available
    if 'name' in repofile_items:
        repodata['name'] = repofile_items['name']
    if 'enabled' in repofile_items:
        repodata['enabled'] = repofile_items['enabled']
    if 'autorefresh' in repofile_items:
        repodata['autorefresh'] = repofile_items['autorefresh']
    if 'gpgcheck' in repofile_items:
        repodata['gpgcheck'] = repofile_items['gpgcheck']

    exists, mod, old_repos = repo_exists(module, repodata, overwrite_multiple)

- if repo:
-     shortname = repo

```

```

- else:
+ if alias:
+     shortname = alias
+ else:
+     shortname = repo

    if state == 'present':
        if exists and not mod:

diff --git a/tests/integration/targets/zypper_repository/files/systemsmanagement_Uyuni_Utils.repo b/tests/integration/targets/zypper_repository/files/systemsmanagement_Uyuni_Utils.repo
new file mode 100644
index 0000000000..1df76802a70
--- /dev/null
+++ b/tests/integration/targets/zypper_repository/files/systemsmanagement_Uyuni_Utils.repo
@@ -0,0 +1,7 @@
+[systemsmanagement_Uyuni_Utils]
+name=Several utilities to develop, build or release Uyuni (openSUSE_Leap_15.3)

```

```

+type=rpm-md
+baseurl=https://download.opensuse.org/repositories/systemsmanagement:/Uyuni:/Utils/openSUSE_Leap_15.3/
+gpgcheck=1
+gpgkey=https://download.opensuse.org/repositories/systemsmanagement:/Uyuni:/Utils/openSUSE_Leap_15.3/repodata/repomd.xml.key
+enabled=1

diff --git a/tests/integration/targets/zypper_repository/meta/main.yml b/tests/integration/targets/zypper_repository/meta/main.yml
new file mode 100644
index 0000000000..181044bec98

```

```

--- /dev/null
+++ b/tests/integration/targets/zypper_repository/meta/main.yml
@@ -0,0 +1,2 @@
+dependencies:

```

```

+ - setup_remote_tmp_dir

diff --git a/tests/integration/targets/zypper_repository/tasks/test.yml b/tests/integration/targets/zypper_repository/tasks/test.yml
index e2b2f8473b6..1033ee1e7d5 100644
--- a/tests/integration/targets/zypper_repository/tasks/test.yml
+++ b/tests/integration/targets/zypper_repository/tasks/test.yml
@@ -19,6 +19,8 @@
+ testrefresh
+   - testprio
+   - Apache_PHP_Modules
+   - systemsmanagement_Uyuni_Stable
+   - systemsmanagement_Uyuni_Utils

- name: collect repo configuration after test
  shell: 'grep . /etc/zypp/repos.d/**'

diff --git a/tests/integration/targets/zypper_repository/tasks/zypper_repository.yml b/tests/integration/targets/zypper_repository/tasks/zypper_repository.yml
index 4490dda7db..dbd9bb0064b 100644
--- a/tests/integration/targets/zypper_repository/tasks/zypper_repository.yml
+++ b/tests/integration/targets/zypper_repository/tasks/zypper_repository.yml
@@ -4,6 +4,11 @@
state: absent
register: zypper_result

+- name: verify no change on test repo deletion
+ assert:
+   that:
+     - "not zypper_result.changed"
+
- name: Add test repo
  community.general.zypper_repository:
    name: test
@@ -51,7 +56,8 @@
command: zypper -x lr testrefresh
register: zypper_result

-- assert:
+- name: verify autorefresh option set properly
+ assert:
+   that:
+     - "autorefresh=\"0\"*" in zypper_result.stdout'

@@ -66,7 +72,8 @@
command: zypper -x lr testprio
register: zypper_result

-- assert:
+- name: verify priority option set properly
+ assert:
+   that:
+     - "priority=\"55\"*" in zypper_result.stdout'

@@ -88,7 +95,8 @@
command: zypper lr chrome2
register: zypper_result2

```

```

-- assert:
+- name: ensure same url cause update of existing repo even if name differ
+ assert:
+   that:
+     - "zypper_result1.rc != 0"
+     - "'not found' in zypper_result1.stderr"
@@ -108,7 +116,8 @@
command: zypper lr samename
register: zypper_result

-- assert:
+- name: ensure url get updated on repo with same name
+ assert:
+   that:
+     - "'/science/' not in zypper_result.stdout"
+     - "'/devel:/languages:/ruby/' in zypper_result.stdout"
@@ -140,7 +149,8 @@
state: present
register: add_repo_again

-- assert:
+- name: no update in case of $releasever usage in url
+ assert:
+   that:
+     - add_repo is changed
+     - add_repo_again is not changed
@@ -151,10 +161,21 @@
state: absent
register: remove_repo

-- assert:

```

```

+- name: verify repo was removed
+ assert:
+   that:
+     - remove_repo is changed

+- name: get list of files in /etc/zypp/repos.d/
+ command: ls /etc/zypp/repos.d/
+ changed_when: false
+ register: releaseverrepo_etc_zypp_reposd
+
+- name: verify removal of file releaseverrepo.repo in /etc/zypp/repos.d/
+ assert:
+   that:
+     - "releaseverrepo" not in releaseverrepo_etc_zypp_reposd.stdout
+
+- name: add a repo by basearch
community.general.zypper_repository:
  name: basearchrepo
@@ -169,7 +190,8 @@
  state: present
  register: add_repo_again

-- assert:
+- name: no update in case of $basearch usage in url
+ assert:
+   that:
+     - add_repo is changed
+     - add_repo_again is not changed
@@ -180,6 +202,74 @@
  state: absent
  register: remove_repo

-- assert:
+- name: verify repo was removed
+ assert:
+   that:
+     - remove_repo is changed
+
+- name: add new repository via url to .repo file
+ community.general.zypper_repository:
+   repo: http://download.opensuse.org/repositories/systemsmanagement:/Uyuni:/Stable/opensUSE_Leap_{{ ansible_distribution_version }}/systemsmanagement:Uyuni:Stable.repo
+   state: present
+   register: added_by_repo_file
+
+- name: get repository details from zypper
+ command: zypper lr systemsmanagement_Uyuni_Stable
+ register: get_repository_details_from_zypper
+
+- name: verify adding via .repo file was successful
+ assert:
+   that:
+     - "added_by_repo_file is changed"
+     - "get_repository_details_from_zypper.rc == 0"
+     - "'/systemsmanagement:/Uyuni:/Stable/' in get_repository_details_from_zypper.stdout"
+
+- name: add same repository via url to .repo file again to verify idempotency
+ community.general.zypper_repository:
+   repo: http://download.opensuse.org/repositories/systemsmanagement:/Uyuni:/Stable/opensUSE_Leap_{{ ansible_distribution_version }}/systemsmanagement:Uyuni:Stable.repo
+   state: present
+   register: added_again_by_repo_file
+
+- name: verify nothing was changed adding a repo with the same .repo file
+ assert:
+   that:
+     - added_again_by_repo_file is not changed
+
+- name: remove repository via url to .repo file
+ community.general.zypper_repository:
+   repo: http://download.opensuse.org/repositories/systemsmanagement:/Uyuni:/Stable/opensUSE_Leap_{{ ansible_distribution_version }}/systemsmanagement:Uyuni:Stable.repo
+   state: absent
+   register: removed_by_repo_file
+
+- name: get list of files in /etc/zypp/repos.d/
+ command: ls /etc/zypp/repos.d/
+ changed_when: false
+ register: etc_zypp_reposd
+
+- name: verify removal via .repo file was successful, including cleanup of local .repo file in /etc/zypp/repos.d/
+ assert:
+   that:
+     - "removed_by_repo_file"
+     - "'/systemsmanagement:/Uyuni:/Stable/' not in etc_zypp_reposd.stdout"
+
+- name: Copy test .repo file
+ copy:
+   src: 'files/systemsmanagement_Uyuni_Utils.repo'
+   dest: '{{ remote_tmp_dir }}'
+
+- name: add new repository via local path to .repo file
+ community.general.zypper_repository:
+   repo: '{{ remote_tmp_dir }}/systemsmanagement_Uyuni_Utils.repo'
+   state: present
+   register: added_by_repo_local_file
+
+- name: get repository details for systemsmanagement_Uyuni_Utils from zypper
+ command: zypper lr systemsmanagement_Uyuni_Utils
+ register: get_repository_details_from_zypper_for_systemsmanagement_Uyuni_Utils
+
+- name: verify adding repository via local .repo file was successful
+ assert:
+   that:
+     - "added_by_repo_local_file is changed"
+     - "get_repository_details_from_zypper_for_systemsmanagement_Uyuni_Utils.rc == 0"
+     - "'/systemsmanagement:/Uyuni:/Utils/' in get_repository_details_from_zypper_for_systemsmanagement_Uyuni_Utils.stdout"

```