Releasing Apache Geode

This article contains all the steps required to release Apache Geode.

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Before you begin

Software dependencies

- 1. git https://git-scm.com/downloads
- 2. docker https://docs.docker.com/docker-for-mac/install/
- 3. gpg tools https://gpgtools.org
- 4. java JDK8 https://adoptopenjdk.net Make sure you have the latest patch release of OpenJDK 1.8.0 (not Oracle JDK).
- 5. Homebrew https://brew.sh/
- 6. svn [on Mac, brew install svn] $\,$
- 7. fly use platform-appropriate download link in bottom right corner of https://concourse.apachegeode-ci.info. Do it this way, not with homebrew, so you get the version that matches concourse.
- 8. cmake, doxygen, and openssI install using an appropriate package manager, e.g. on Mac: brew install doxygen && brew install cmake && brew install openssI
- 9. jinja pip3 install Jinja2
- 10. PyYAML pip3 install PyYAML
- 11. text editor (vi or whatever you prefer)
- 12. web browser

Permission and keys



Permission and Keys:

- Ensure that the release manager is (or will be able to work with) a Geode PMC member (needed at svn checkout step in prepare_rc).
- Ensure that the release manager has bulk modification permissions on Apache Geode JIRA.

To verify

- a. Go to : https://issues.apache.org/jira/secure/Dashboard.jspa login Issues Search for Issues select Geode in the Project list
- b. After logging in, on the top right side of the page click on Tools Bulk Change Current Page
- c. Select any ticket and click **Next**
- d. The **Transition Issue** option should not be blocked as N/A. If it is not blocked means that you have bulk operation permission.
- e. You will also need admin permissions to manage releases in Jira. To check, see if you can see an Add button on https://issue s.apache.org/jira/projects/GEODE?selectedItem=com.atlassian.jira.jira-projects-plugin:release-page
- f. If you don't have permissions, send a mail requesting permission to dev@geode.apache.org.

- · Ensure that the release manager has permission to modify the wiki for the release docs: Release Notes
 - 1. If you don't have permissions, send a mail requesting permission to dev@geode.apache.org.
- Ensure that the release manager has permission to deploy pipelines to Geode CI (you need to be able to login to https://concourse.apachegeode-ci.info AND send a request to dev@geode.apache.org requesting concourse permissions for your login)
- Ensure that the release manager has Docker Hub credentials with permission to upload Apache Geode to Docker Hub. To get permissions follow the steps below
 - a. If you don't have a docker hub account create one at https://hub.docker.com/
 - b. After creating the docker hub ID, send an email to dev@geode.apache.org requesting access to upload Apache Geode artifacts to Docker Hub mentioning your docker id.
- Ensure that the release manager has a valid pgp key. Make sure to keep your gpg passphrase in a safe place (you will need it again later). The email address associated with your gpg key **must** be your @apache.org email address.
 - a. For MacOS use https://gpgtools.org/
 - b. For Ubuntu https://askubuntu.com/questions/100281/how-do-i-make-a-pgp-key
 - c. Ensure that the public key is published and uploaded to servers.
 - i. Add the key fingerprint to https://id.apache.org under OpenPGP Public Key Primary Fingerprint. The fingerprint can be found in the GPG Keychain in MacOS or the second line of the command executed in step a.
 - ii. Upload your public key into ALL of the following keyservers:
 - 1. http://pool.sks-keyservers.net:11371
 - 2. http://keyserver.ubuntu.com:11371
 3. gpg --send-keys 8_digit_fingerprint
 gpg --keyserver pgp.mit.edu --send-keys 8_digit_fingerprint
 gpg --keyserver keyserver.ubuntu.com --send-keys 8_digit_fingerprint
 - d. Ask a fellow committer to co-sign your key. Note: it may take several hours or overnight before other's can "see" that your key has been uploaded, and as along again for you to see that they signed it, so start this process early.
- · Add the release manager's public key block to the KEYS file in develop branch, if they are not already present in it.

a. On MacOS: (More information available at https://www.apache.org/dev/release-signing.html#basic-facts)

```
On MacOS terminal

(gpg --list-sigs <your name> && gpg --armor --export <your name>) >> keys.log
```

- b. Take the contents of keys.log and append it to KEYS file in the develop branch of Apache Geode. Commit and push to origin.
- c. Sample key block which needs to be appended to the KEYS file in develop:

```
rsa4096 2018-01-04 [SC] [expires: 2022-01-04]
pub
      CE6CD0A89480B1B9FCB98699274C66710770C135
uid
              [ultimate] Nabarun Nag <nag@cs.wisc.edu>
sig 3
             274C66710770C135 2018-01-04 Nabarun Nag <nag@cs.wisc.edu>
            C8D3705F9DBE2177 2018-02-26 Jason Huynh < jasonhuynh@apache.org>
sia 3
sub rsa4096 2018-01-04 [E] [expires: 2022-01-04]
             274C66710770C135 2018-01-04 Nabarun Nag <nag@cs.wisc.edu>
----BEGIN PGP PUBLIC KEY BLOCK----
\verb"mQINBFpOogwBEADlT2Ue6XDFHqbM/LbZXhHMw4rcT4ifuBGyibbUbhLWGimav5tI"
buGRxOViV2q5FNIEYK6Gyfr1kKTlBxCZxkmbNj5lyqgBM7HfL0sTQ2kGd9IE7rPz
KQ65yzUdKd4Aacm9Zlfja6pV6vYbMBdd4gcGFfsobh4yD0dZFXBlkEiqKV89PhxG
h9PaBFN6FfDYTaUwir2MveV54N5ynPKcVt9Ler5v6wo/1Mr+bxoZ5dy15UMqxgHT
YfRDGmLvCPjI0Aabc86bzgi8FJ8QdW1/oBLH/fjDardQOSgGCI7Smz4F52LGXb7Z
Y79TWNoe0dBLf6B8dmX+aqfWhziCz2Ijy8lF8sfQl2DalG+YpBkBBsNs8j/6lpHr
\verb|Fgh2AddGmNuaP+tMFGCtdeHujkSbx7b1UOkxgLTS7nsRM016QN4czTNYcaUFgVU4| \\
Ig==
=VFar
----END PGP PUBLIC KEY BLOCK----
```

- 2. Check that git is configured with your apache email address
 - a. check current email: git config user.email
 - b. set to apache if necessary: git config --global user.email your_apache_ldap_username@apache.org
- 3. In GitHub, from drop-down menu in top-right of screen:
 - a. under Settings > Emails > Add email address, add your apache email address (and check your inbox for verification link)
 - b. paste your public key block (same what you put in KEYS file) into GitHub under Settings > SSH and GPG keys > New GPG Key

Terminology

A major release is a version x . 0 . 0 and allows/implies breaking changes, removal of deprecated methods, changes to minimum JDK, etc.

A minor release is a version x.y.0 where y > 0 and typically allows/implies new features.

A patch release is a version x.y.n where n > 0 and should contain a limited number of critical fixes only.

Except where noted, all instructions in this guide apply to all three types of releases. Dev list proposals for patch releases may be made at any time since the branch already exists, however some planning ahead is helpful for major or minor releases. since it is usually desirable to cut the branch a couple months in advance.

Propose cutting a support branch (major/minor only)

Send a [DISCUSS] email to dev@geode.apache.org proposing that a new support branch be created.

Review LICENSE and NOTICE files

Confirm that the Geode LICENSE and NOTICE files on develop are accurate (ask for help on the dev list if needed). This is best done before cutting the branch, otherwise be sure to backport any changes to the support branch as well.

1. cd .. && ./geode/dev-tools/release/license_review.sh -v HEAD -p 1.12.0 (replace 1.12.0 with the version of the previous release) to check the LICENSE files for missing dependencies or outdated versions and compare dependencies against a previous release. If any dependencies were removed, manually check for stale references in LICENSE or NOTICE files that can be removed. If new dependencies were added that have Apache 2.0 License, add them to the license_review script's isApache2 function. If a new 3rd-party .jar is now appearing in the binary distribution, update geode-assembly/src/main/dist/LICENSE appropriately. If new 3rd-party intellectual property was checked into the source tree (e.g. a javascript library), update both LICENSE and geode-assembly/src/main/dist/LICENSE.

Branching for release

Create the support branches (major/minor only)

1. From one directory above a checkout of latest geode **develop**, run the create_support_branches script. This will create branches on all projects and update version numbers appropriately, and guide you though creating the support pipeline, updating Jira, and creating a PR to bump develop to the next version.

```
cd .. geode/dev-tools/release/create_support_branches.sh -v 1.13 -g your_github_username
```

2. Review the benchmark baseline on the support branch. It should usually be {previous release}

See ci/pipelines/shared/jinja.variables.yml around line 20 (under benchmarks:)

```
baseline_version: '1.12.0'
```

3. Send email to dev@geode.apache.org informing the creation of the support branch and any rules for backporting changes to the branch.

```
Hello Geode Dev Community,

We have created a new support branch for Apache Geode {x.y.0} - "support/{x.y}"

Please focus your acceptance testing on this branch and raise any concerns in the next few weeks. If any changes are needed please add blocks-{x.y.0} label in Jira and create a PR against support/{x.y}. After some quiet period we will prepare a release candidate and begin voting upon it.

Regards
{Release Manager}
```

4. For the duration of the release process, continue to monitor the new release pipeline and address any issues that may arise, including analyzing any test failures (ask for volunteers on the dev list to investigate any failures you are unsure of).

Bump the version of the **develop** branch (major/minor only)

1. The create_support_branches script already walked you through creating the PR for this, adding the new version to Jira, and bumping the pipeline version on develop. (note: you must be in the Jira Administrators group to see the Add button in Jira; request permission on the dev list if you don't see it).

Validate Fix Versions in JIRA

There are two parts to this audit:

- 1. Does every commit since the last release have a corresponding Jira ticket marked as Fixed in this version?
- 2. Can every Jira ticket marked as fixed in this version be traced to a commit in this support branch since the last release?

To help automate the process of identifying commits and tickets in need of review, you may find this script useful, or create your own script.

Tips:

- If a Jira ticket is fixed on develop AND cherry-picked to a support branch, it should list both fix versions.
- If a Jira ticket is fixed by way of another commit or Jira ticket, there should be a comment detailing this.
- If a Jira ticket is partially fixed but there is more work to be done in the next release, splitting into two tickets may be the best way to represent that.
- · Don't forget about geode-native. It's a separate git repository but uses GEODE Jira tickets and is released as part of Geode.
- · Be mindful of revert commits.
- Be mindful of Jira tickets resolved as "Won't Fix", "Duplicate" etc.
- Be mindful of Jira tickets that were re-opened, but the Fixed version was never cleared.
- For changes that came in close to the time a support branch was cut, double-check whether the fix actually made it onto the branch. The list of release start dates can be helpful, but checkout the release tag to confirm for certain.

When in doubt, reach out to people that have been involved the with ticket to confirm its status. Many times they just forgot to marked it fixed
when their PR got merged, or forgot to fill in the fixed version.

Begin preparing release documentation

- Start preparing the release docs at Release Notes. Ask the community for suggestions on fixes and features to highlight, or go through the commits yourself and choose 5-10 items of interest.
- 2. Also write up a short paragraph on what was added to the release. This will need to go with the final announce email. Sample:

Geode 1.13.0 contains a number of improvements and bug fixes. Changes since last release:

- Performance improvements in OQL order-by and distinct queries in client/server when security is enabled.
- New GFSH commands were added to get/set cluster config and to destroy gateway receivers.
- A new post processor was added to the new client protocol.
- Pulse now supports legacy SSL options.
- Auto-reconnecting members no longer reuse old addresses and IDs.
- Duplicated or member-specific receivers are removed from cluster config during rolling upgrades. Users are encouraged to upgrade to the latest release.

Creating a Release Candidate

Accept critical fixes to the support branch

It is expected that some stabilization work may be needed once the support branch is cut. This phase may be very short or very long until a Release Candidate is proposed.

The Release Manager will set the rules for backporting changes to the support branch. For example, they may stipulate critical fixes only and/or require a dev list proposal and/or require a PR against the support branch and/or require a label to be added in Jira. In all cases, fixes need to be made on develop first, then backported.

By some method, determine when all fixes are in. This might involve one or more of:

- · checking for Jira tickets tagged as blockers that are not yet delivered
- · checking for PRs that are not yet merged
- checking on the dev list for proposals
- waiting for any test failures or other concerns to be resolved
- waiting for some quiet period of no new blocker, PRs, proposals, or concerns.

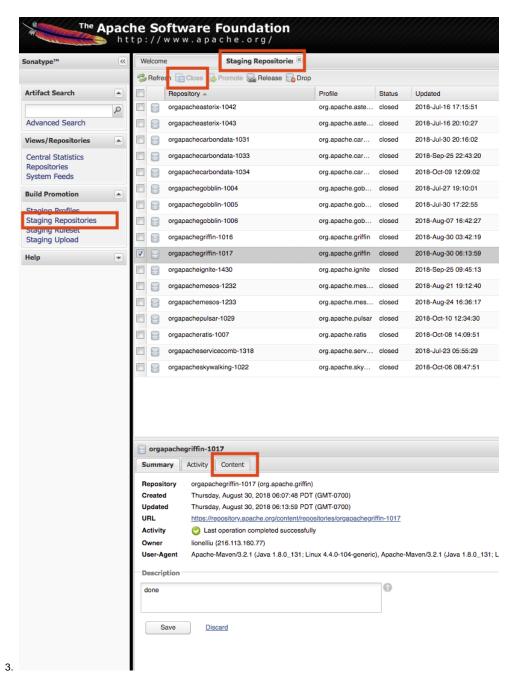
When all signs point to "go", you can either just create the RC and propose it in one email, or if there is any uncertainly, start a dev list discussion first.

Create the release candidate

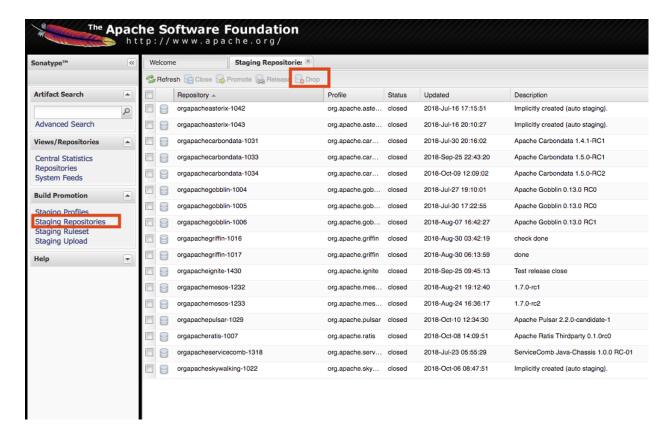
1. From one directory above a checkout of latest geode **develop**, run the prepare_rc script (a release-n.n.n-workspace dir will be created in the current directory). This script will do a fresh checkout of the support branch for all repos, build them, and prepare the artifacts. It will also prepare RC tags in each repository and finally pre-stage to nexus. Do not run this in a remote shell or headless environment, as a GUI is required to prompt for your GPG passphrase (several times) and your ASF LDAP password (Apache password). Do not include @apache.org in your apache username. If your are not a PMC member, when prompted for SVN password, hit enter and ask a PMC member to enter their username and password, otherwise you will not be able to make the final release later.

```
geode/dev-tools/release/prepare_rc.sh -v 1.13.0.RC1 -k last_8_digits_of_your_gpg_key -a
your_apache_ldap_username
```

2. The "next steps" printed out at the end of the prepare_rc script will walk you through the remaining steps to finalize nexus staging (pictured below), publish the release candidate, and send the VOTE email.



If there is an older geode staging repository listed (from a previous RC, make sure you drop it. Find "orgapachegeode-####" and click on "Drop"



Sanity Checks

1. As instructed by commit_rc, before giving the RC to the community to validate, make an rc pipeline to validate that the artifacts are viable (do this in a separate terminal window as it can be quite verbose):

geode/dev-tools/release/deploy_rc_pipeline.sh -v 1.13

2. wait for all jobs to turn green (about 1-2 hours)

Send out an email announcing the RC

The last instruction from the prepare_rc script will be to run the commit_rc script. When that is complete, it will print out the contents of the email for you to send (and also copy it to your clipboard, if you have pbcopy installed). If you need to re-generate the email for any reason, use geode/devtools/release/print_rc_email.sh.

Click on every link to validate (especially release notes!), then send the email to the dev@geode.apache.org with subject "[VOTE] Apache Geode <ver>. RC<n>".

The voting deadline should be at least 72 hours in the future (typically 3pm 5 days hence if there is a weekend). For emergency patch releases, an expedited voting deadline of as little as 24 hours may be used.

Tally the votes

After the deadline has passed, reply to the VOTE thread with a voting result summary similar to the following (use the PMC roster to determine which votes are binding):

Sample Voting Results Email It's past the announced deadline and we have enough votes to close the vote. Voting status +1: 3 binding votes * Name (PMC member) * Name (PMC member) Name (PMC member) * Other Name * Other Name +0: zero votes -0: zero votes -1: zero votes The voting meets the requirements of at least 3 PMC members with +1 votes and has the required majority of +1 Apache Geode $\{ver\}.RC\{n\}$ has passed the vote and we will finalize the release shortly. Thanks everyone for the great work! -{Release Manager}

If not enough votes are received, the release manager may, at their discretion, extend the voting deadline, or abandon the release.

If the voting is successful, proceed to the next section. If showstopper issues were raised, create a new release candidate. If the release is to be abandoned, destroy any staged artifacts in nexus and svn.

Finalizing (shipping) the Release

Promote the release candidate to official release

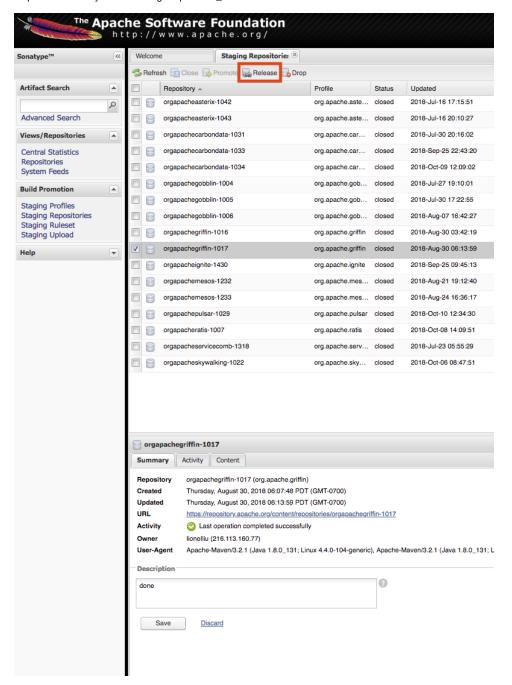
Once a release candidate has been approved:

- 1. Click 'Release' in http://repository.apache.org/ (pictured below step 7)
- 2. Make sure you have forked https://github.com/Homebrew/homebrew-core (click the Fork button in top-right corner)
- 3. Make sure you have forked https://github.com/apache/geode-native
- 4. Make sure you have forked https://github.com/apache/geode
- 5. Make sure you can run docker info and docker images. On Linux, you may need to add sudo before each docker command in the promote_rc script and/or sudo usermod -aG docker \$USER
- 6. From the same directory you ran the previous release scripts, run the promote_rc script (note: you must be a Geode PMC member to svn commit to dist/release/geode):

```
geode/dev-tools/release/promote_rc.sh -v 1.13.0.RC1 -k last_8_digits_of_your_gpg_key -g
your_github_username
```

7. The "next steps" printed at the end of the promote_rc script will walk you through the remaining tasks to validate the docker image, update Jira, make the brew PR, then finalize the release, followed by the contents of the announce email (also copied to your clipboard, if you have pbcopy installed). You can also (re)generate the email later using geode/dev-tools/release/print_announce_email.sh. It's ok to start on the

steps below while you are waiting for promote_rc to finish.

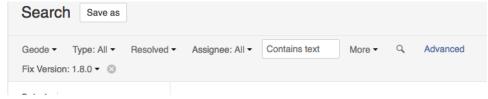


Mark the version as released in Jira

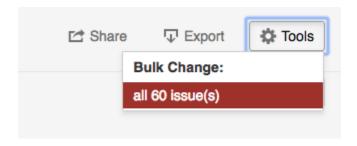
- 1. Go to https://issues.apache.org/jira/projects/GEODE?selectedItem=com.atlassian.jira.jira-projects-plugin:release-page
- 2. Click on the \dots to get the Actions pop-up menu for the version you are releasing
- 3. Click Release (note: you must be in the Jira Administrators group to do this, ask on the dev list if you are not).
- 4. While you're in there, add the next patch release (i.e. if you are releasing x . y . n, add x . y . n+1)

Transition JIRA issues fixed in this release from Resolved Closed

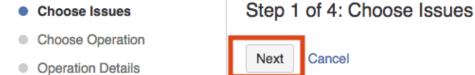
1. List all the JIRAs with fix version as the release version and status as resolved.



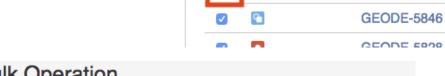
2. Using bulk operations transition to closed state.











Bulk Operation

- Choose Issues
 Selected 60 issues from 1 project(s)
- Choose Operation
- Operation Details
- Confirmation

Step 2 of 4: Choose Operation

Patch Info

Key

Choose the operation you wish to perforr



Choose Issues Selected 60 issues from 1 project(s) Choose Operation Operation Details Confirmation Step 3 of 4: Operation Details Select the workflow transition to execute on the associated issues. Workflow: patch-available, re-open possible Available Workflow Actions Reopen Issue

Close Issue

Publish to GitHub

- 1. Go to https://github.com/apache/geode/tags
- 2. Locate (but do not click on) the row with the final release tag (e.g. rel/v1.13.0)
- 3. Click on the 2nd "..." menu (the one to the right of the Verified bubble), then Create release.
- 4. "Existing tag" should be selected.
- 5. Fill in Release Title e.g. Apache Geode 1.13.0.
- 6. Describe the release:
 - a. Copy the summary sentence from the release notes.
 - b. Add the SHA256 (e.g. from the directory you ran the release scripts, cat release-1.13.0-workspace/geode/geode-assembly /build/distributions/apache-geode-1.13.0.tgz.sha256).
 - c. Add a link to the release notes. Example:

Sample Release Description

This release contains some new gfsh commands and support for SNI as well as a number of improvements and bug fixes.

sha256 for apache-geode-1.13.0.tgz is 8caf6dcafa5c6bb7c10dc7d512d0569dd16e463e01c18997118e20a5f43e6097

See full release notes at https://cwiki.apache.org/confluence/display/GEODE/Release+Notes#ReleaseNotes-1.13.0

- 7. Click where it says "Attach binaries" and upload the Apache Geode .tgz (found in the directory you ran the release scripts under release-1.13.0-workspace/geode/geode-assembly/build/distributions/apache-geode-1.13.0.tgz)
- 8. Click the green Publish Release button.

Publish javadocs and documentation to the website

Ask on the dev list if you need help with these steps.

- Keep only the latest patch release of each of the 3 most recent minors (including the one you're about to release) on https://geode.apache.org/releases/
- 2. Build website from sources as described in geode-site/website/README.md.
- 3. In the generated site, create the directory geode-site/content/releases/latest.
- 4. Obtain a copy of the javadoc directory from the binary release and put it in the geode-site/content/releases/latest directory (link from the website's Docs landing page points to ../releases/latest/javadoc).
- 5. Deploy the generated site by checking it into the asf-site branch of the apache-geode repo.

Final checks

(note: These steps are also covered by the "Final steps" printed at the end of promote_rc)

1. Confirm that your brew PR has been merged or closed and brew install apache-geode picks up the new release. Note: this may take overnight...no need to hold the release announcement just for brew.

brew uninstall apache-geode brew install apache-geode gfsh version

- 2. Check that docs for the version you are releasing appear on https://geode.apache.org/docs/
- 3. Check that download detail for the version you are releasing appear on https://geode.apache.org/releases/
- 4. Check that the release tag appears as "Verified" in https://github.com/apache/geode/tags (if not, see last step in Permissions and Keys)

Ask for a volunteer to update dependencies on develop (major/minor only)

Now is the best time to bump dependency versions on develop for the various 3rd-party libraries used by Geode. Start a DISCUSS thread asking for a volunteer to lead this effort.

To: dev@geode.apache.org

Subject: [DISCUSS] Volunteer to update 3rd-party libraries used by GEODE

```
Hello Apache Geode Community,

It's time to update the 3rd-party libraries used by GEODE. We need a volunteer to take on this responsibility.

https://github.com/apache/geode/blob/develop/dev-tools/dependencies/README.md describes how to carry out this task.

It would be awesome to get this done within the next few weeks, to allow plenty of time to shake out any issues before the next release.

Regards,

{Release Manager} on behalf of the Apache Geode team
```

Remove old unsupported branches (major/minor only)

Geode's N-2 support policy allows patch releases to be proposed for its 3 most recent minors, e.g. on the day 1.15.0 is released, 1.12 would become no longer supported. But this is not set in stone, so it's probably wise to start a discussion on the dev list before just running this command!

1. remove 1.<N-3> support branch, pipelines and RC tags:

```
geode/dev-tools/release/end_of_support.sh -v 1.{N-3}
```

Note tha end_of_support is a **destructive** command. It will prompt you to continue, then will delete the branch and pipeline. If run by accident, these can be restored by re-flying the pipeline and re-pushing the branch (if you or someone has an up-to-date local copy, otherwise google git reflog for more ways to recover a deleted branch).

Send the announce mail

The template for this email was output at the end of promote_rc, or you can re-generate it using geode/dev-tools/release /print_announce_email.sh. Consider customizing the generated text if there are more upcoming releases (or even waiting and combining the announcements) or if there are notable fixes worth highlighting after the generic "contains a number of fixes".

- *** Important: Send the email from your apache email ID*** (otherwise announce@apache.org will bounce. See https://infra.apache.org/committer-email. html for how to send email from your apache email address)
- *** Important: Send the email as plain text***(otherwise announce@apache.org will reject the email. If using gmail, at the bottom of the compose window, click the three-dot menu then click Plain text mode)

Example:

To: user@geode.apache.org, announce@apache.org, dev@geode.apache.org

Subject: [ANNOUNCE] Apache Geode (version e.g. 1.13.0)

```
The Apache Geode community is pleased to announce the availability of Apache Geode {version e.g. 1.13.0}.

Apache Geode is a data management platform that provides a database-like consistency model, reliable transaction processing and a shared-nothing architecture to maintain very low latency performance with high concurrency
```

processing.

Geode {version e.g. 1.13.0} contains a number of improvements and bug fixes. It includes performance improvements in OQL order-by and distinct queries in client/server when security is enabled. New GFSH commands were added to get/set cluster config and to destroy gateway receivers. A new post processor was added to the new client protocol. Pulse now supports legacy SSL options. Auto-reconnecting members no more reuse old addresses and IDs. Duplicated or member-specific receivers are removed from cluster config during rolling upgrades. Users are encouraged to upgrade to the latest release.

For the full list of changes please review the release notes:

https://cwiki.apache.org/confluence/display/GEODE/Release+Notes#ReleaseNotes-{version e.g. 1.13.0}

The release artifacts can be downloaded from the project website: https://geode.apache.org/releases/

The release documentation is available at: https://geode.apache.org/docs/guide/{version eg. 113}/about_geode.html

We would like to thank all the contributors that made the release possible. Regards,

{Release Manager} on behalf of the Apache Geode team