2.22.0

Git 2.22 Release Notes ======================

Updates since v2.21 ------------------

Backward compatibility note

- The filter specification "--filter=sparse:path=<path>" used to create a lazy/partial clone has been removed. Using a blob that is part of the project as sparse specification is still supported with the "--filter=sparse:oid=<blob>" option.

UI, Workflows & Features

- "git checkout --no-overlay" can be used to trigger a new mode of checking out paths out of the tree-ish, that allows paths that match the pathspec that are in the current index and working tree and are not in the tree-ish.

- The %(trailers) formatter in "git log --format=…" now allows to optionally pick trailers selectively by keyword, show only values, etc.

- Four new configuration variables {author,committer}.{name,email} have been introduced to override user.{name,email} in more specific cases.

- Command-line completion (in contrib/) learned to tab-complete the "git submodule absorbgitdirs" subcommand.

- "git branch" learned a new subcommand "--show-current".

- Output from "diff --cc" did not show the original paths when the merge involved renames. A new option adds the paths in the original trees to the output.

- The command line completion (in contrib/) has been taught to complete more subcommand parameters.

- The final report from "git bisect" used to show the suspected culprit using a raw "diff-tree", with which there is no output for a merge commit. This has been updated to use a more modern and human readable output that still is concise enough.

- "git rebase --rebase-merges" replaces its old "--preserve-merges" option; the latter is now marked as deprecated.

- Error message given while cloning with --recurse-submodules has been updated.

- The completion helper code now pays attention to repository-local configuration (when available), which allows --list-cmds to honour a repository specific setting of completion.commands, for example.

- "git mergetool" learned to offer Sublime Merge (smerge) as one of its backends.

- A new hook "post-index-change" is called when the on-disk index file changes, which can help e.g. a virtualized working tree implementation.

- "git difftool" can now run outside a repository.

- "git checkout -m <other>" was about carrying the differences between HEAD and the working-tree files forward while checking out another branch, and ignored the differences between HEAD and the index. The command has been taught to abort when the index and the HEAD are different.

- A progress indicator has been added to the "index-pack" step, which often makes users wait for completion during "git clone".

- "git submodule" learns "set-branch" subcommand that allows the submodule.*.branch settings to be modified.

- "git merge-recursive" backend recently learned a new heuristics to infer file movement based on how other files in the same directory moved. As this is inherently less robust heuristics than the one based on the content similarity of the file itself (rather than based on what its neighbours are doing), it sometimes gives an outcome unexpected by the end users. This has been toned down to leave the renamed paths in higher/conflicted stages in the index so that the user can examine and confirm the result.

- "git tag" learned to give an advice suggesting it might be a mistake when creating an annotated or signed tag that points at another tag.

- The "git pack-objects" command learned to report the number of objects it packed via the trace2 mechanism.

- The list of conflicted paths shown in the editor while concluding a conflicted merge was shown above the scissors line when the clean-up mode is set to "scissors", even though it was commented out just like the list of updated paths and other information to help the user explain the merge better.

- The trace2 tracing facility learned to auto-generate a filename when told to log to a directory.

- "git clone" learned a new --server-option option when talking over the protocol version 2.

- The connectivity bitmaps are created by default in bare repositories now; also the pathname hash-cache is created by default to avoid making crappy deltas when

repacking.

- "git branch new A...B" and "git checkout -b new A...B" have been taught that in their contexts, the notation A...B means "the merge base between these two commits", just like "git checkout A...B" detaches HEAD at that commit.

- Update "git difftool" and "git mergetool" so that the combinations of {diff,merge}.{tool,guitool} configuration variables serve as fallback settings of each other in a sensible order.

- The "--dir-diff" mode of "git difftool" is not useful in "--no-index" mode; they are now explicitly marked as mutually incompatible.

Performance, Internal Implementation, Development Support etc.

- The diff machinery, one of the oldest parts of the system, which long predates the parse-options API, uses fairly long and complex handcrafted option parser. This is being rewritten to use the parse-options API.

- The implementation of pack-redundant has been updated for performance in a repository with many packfiles.

- A more structured way to obtain execution trace has been added.

- "git prune" has been taught to take advantage of reachability bitmap when able.

- The command line parser of "git commit-tree" has been rewritten to use the parse-options API.

- Suggest GitGitGadget instead of submitGit as a way to submit patches based on GitHub PR to us.

- The test framework has been updated to help developers by making it easier to run most of the tests under different versions of over-the-wire protocols.

- Dev support update to make it easier to compare two formatted results from our documentation.

- The scripted "git rebase" implementation has been retired.

- "git multi-pack-index verify" did not scale well with the number of packfiles, which is being improved.

- "git stash" has been rewritten in C.

- The "check-docs" Makefile target to support developers has been updated.

- The tests have been updated not to rely on the abbreviated option names the parse-options API offers, to protect us from an abbreviated form of an option that used to be unique within the command getting non-unique when a new option that share the same prefix is added.

- The scripted version of "git rebase -i" wrote and rewrote the todo list many times during a single step of its operation, and the recent C-rewrite made a faithful conversion of the logic to C. The implementation has been updated to carry necessary information around in-core to avoid rewriting the same file over and over unnecessarily.

- Test framework update to more robustly clean up leftover files and processes after tests are done.

- Conversion from unsigned char[20] to struct object_id continues.

- While running "git diff" in a lazy clone, we can upfront know which missing blobs we will need, instead of waiting for the on-demand machinery to discover them one by one. The code learned to aim to achieve better performance by batching the request for these promised blobs.

- During an initial "git clone --depth=…" partial clone, it is pointless to spend cycles for a large portion of the connectivity check that enumerates and skips promisor objects (which by definition is all objects fetched from the other side). This has been optimized out.

- Mechanically and systematically drop "extern" from function declaration.

- The script to aggregate perf result unconditionally depended on libjson-perl even though it did not have to, which has been corrected.

- The internal implementation of "git rebase -i" has been updated to avoid forking a separate "rebase—interactive" process.

- Allow DEP and ASLR for Windows build to for security hardening.

- Performance test framework has been broken and measured the version of Git that happens to be on $PATH, not the specified one to measure, for a while, which has been corrected.

- Optionally "make coccicheck" can feed multiple source files to spatch, gaining performance while spending more memory.

- Attempt to use an abbreviated option in "git clone --recurs" is responded by a request to disambiguate between --recursive and --recurse-submodules, which is bad because these two are synonyms. The parse-options API has been extended to define such synonyms more easily and not produce an unnecessary failure.

- A pair of private functions in http.c that had names similar to fread/fwrite did not return the number of elements, which was found to be confusing.

- Update collision-detecting SHA-1 code to build properly on HP-UX.

Fixes since v2.21 -----------------

- "git prune-packed" did not notice and complain against excess arguments given from the command line, which now it does. (merge 9b0bd87ed2 rj/prune-packed-excess-args later to maint).

- Split-index fix. (merge 6e37c8ed3c nd/split-index-null-base-fix later to maint).

- "git diff --no-index" may still want to access Git goodies like --ext-diff and --textconv, but so far these have been ignored, which has been corrected. (merge 287ab28bfa jk/diff-no-index-initialize later to maint).

- Unify RPC code for smart http in protocol v0/v1 and v2, which fixes a bug in the latter (lack of authentication retry) and generally improves the code base. (merge a97d00799a jt/http-auth-proto-v2-fix later to maint).

- The include file compat/bswap.h has been updated so that it is safe to (accidentally) include it more than once. (merge 33aa579a55 jk/guard-bswap-header later to maint).

- The set of header files used by "make hdr-check" unconditionally included sha256/gcrypt.h, even when it is not used, causing the make target to fail. We now skip it when GCRYPT_SHA256 is not in use. (merge f23aa18e7f rj/hdr-check-gcrypt-fix later to maint).

- The Makefile uses ’find’ utility to enumerate all the *.h header files, which is expensive on platforms with slow filesystems; it now optionally uses "ls-files" if working within a repository, which is a trick similar to how all sources are enumerated to run ETAGS on. (merge 92b88eba9f js/find-lib-h-with-ls-files-when-possible later to maint).

- "git rebase" that was reimplemented in C did not set ORIG_HEAD correctly, which has been corrected. (merge cbd29ead92 js/rebase-orig-head-fix later to maint).

- Dev support. (merge f545737144 js/stress-test-ui-tweak later to maint).

- CFLAGS now can be tweaked when invoking Make while using DEVELOPER=YesPlease; this did not work well before. (merge 6d5d4b4e93 ab/makefile-help-devs-more later to maint).

- "git fsck --connectivity-only" omits computation necessary to sift the objects that are not reachable from any of the refs into unreachable and dangling. This is now enabled when dangling objects are requested (which is done by default, but can be overridden with the "--no-dangling" option). (merge 8d8c2a5aef jk/fsck-doc later to maint).

- On platforms where "git fetch" is killed with SIGPIPE (e.g. OSX), the upload-pack that runs on the other end that hangs up after detecting an error could cause "git fetch" to die with a signal, which led to a flaky test. "git fetch" now ignores SIGPIPE during the network portion of its operation (this is not a problem as we check the return status from our write(2)s). (merge 143588949c jk/no-sigpipe-during-network-transport later to maint).

- A recent update broke "is this object available to us?" check for well-known objects like an empty tree (which should yield "yes", even when there is no on-disk object for an empty tree), which has been corrected. (merge f06ab027ef jk/virtual-objects-do-exist later to maint).

- The setup code has been cleaned up to avoid leaks around the repository_format structure. (merge e8805af1c3 ma/clear-repository-format later to maint).

- "git config --type=color ..." is meant to replace "git config --get-color" but there is a slight difference that wasn't documented, which is now fixed. (merge cd8e7593b9 jk/config-type-color-ends-with-lf later to maint).

- When the "clean" filter can reduce the size of a huge file in the working tree down to a small "token" (a la Git LFS), there is no point in allocating a huge scratch area upfront, but the buffer is sized based on the original file size. The convert mechanism now allocates very minimum and reallocates as it receives the output from the clean filter process. (merge 02156ab031 jh/resize-convert-scratch-buffer later to maint).

- "git rebase" uses the refs/rewritten/ hierarchy to store its intermediate states, which inherently makes the hierarchy per worktree, but it didn't quite work well. (merge b9317d55a3 nd/rewritten-ref-is-per-worktree later to maint).

- "git log -L<from>,<to>:<path>" with "-s" did not suppress the patch output as it should. This has been corrected. (merge 05314efaea jk/line-log-with-patch later to maint).

- "git worktree add" used to do a "find an available name with stat and then mkdir", which is race-prone. This has been fixed by using mkdir and reacting to EEXIST in a loop. (merge 7af01f2367 ms/worktree-add-atomic-mkdir later to maint).

- Build update for SHA-1 with collision detection. (merge 07a20f569b jk/sha1dc later to maint).

- Build procedure has been fixed around use of asciidoctor instead of asciidoc. (merge 185f9a0ea0 ma/asciidoctor-fixes later to maint).

- remote-http transport did not anonymize URLs reported in its error messages at places. (merge c1284b21f2 js/anonymize-remote-curl-diag later to maint).

- Error messages given from the http transport have been updated so that they can be localized. (merge ed8b4132c8 js/remote-curl-i18n later to maint).

- "git init" forgot to read platform-specific repository configuration, which made Windows port to ignore settings of core.hidedotfiles, for example.

- A corner-case object name ambiguity while the sequencer machinery is working (e.g. "rebase -i -x") has been fixed.

- "git format-patch" did not diagnose an error while opening the output file for the cover-letter, which has been corrected. (merge 2fe95f494c jc/format-patch-error-check later to maint).

- "git checkout -f <branch>" while the index has an unmerged path incorrectly left some paths in an unmerged state, which has been corrected.

- A corner case bug in the refs API has been corrected. (merge d3322eb28b jk/refs-double-abort later to maint).

- Unicode update. (merge 584b62c37b bb/unicode-12 later to maint).

- dumb-http walker has been updated to share more error recovery strategy with the normal codepath.

- A buglet in configuration parser has been fixed. (merge 19e7fdaa58 nd/include-if-wildmatch later to maint).

- The documentation for "git read-tree --reset -u" has been updated. (merge b5a0bd694c nd/read-tree-reset-doc later to maint).

- Code clean-up around a much-less-important-than-it-used-to-be update_server_info() function. (merge b3223761c8 jk/server-info-rabbit-hole later to maint).

- The message given when "git commit -a <paths>" errors out has been updated. (merge 5a1dbd48bc nd/commit-a-with-paths-msg-update later to maint).

- "git cherry-pick --options A..B", after giving control back to the user to ask help resolving a conflicted step, did not honor the options it originally received, which has been corrected.

- Various glitches in "git gc" around reflog handling have been fixed.

- The code to read from commit-graph file has been cleanup with more careful error checking before using data read from it.

- Performance fix around "git fetch" that grabs many refs. (merge b764300912 jt/fetch-pack-wanted-refs-optim later to maint).

- Protocol v2 support in "git fetch-pack" of shallow clones has been corrected.

- Performance fix around "git blame", especially in a linear history (which is the norm we should optimize for). (merge f892014943 dk/blame-keep-origin-blob later to maint).

- Performance fix for "rev-list --parents — pathspec". (merge 8320b1dbe7 jk/revision-rewritten-parents-in-prio-queue later to maint).

- Updating the display with progress message has been cleaned up to deal better with overlong messages. (merge 545dc345eb sg/overlong-progress-fix later to maint).

- "git blame — path" in a non-bare repository starts blaming from the working tree, and the same command in a bare repository errors out because there is no working tree by definition. The command has been taught to instead start blaming from the commit at HEAD, which is more useful. (merge a544fb08f8 sg/blame-in-bare-start-at-head later to maint).

- An underallocation in the code to read the untracked cache extension has been corrected. (merge 3a7b45a623 js/untracked-cache-allocfix later to maint).

- The code is updated to check the result of memory allocation before it is used in more places, by using xmalloc and/or xcalloc calls. (merge 999b951b28 jk/xmalloc later to maint).

- The GETTEXT_POISON test option has been quite broken ever since it was made runtime-tunable, which has been fixed. (merge f88b9cb603 jc/gettext-test-fix later to maint).

- Test fix on APFS that is incapable of store paths in Latin-1. (merge 3889149619 js/iso8895-test-on-apfs later to maint).

- "git submodule foreach <command> --quiet" did not pass the option down correctly, which has been corrected. (merge a282f5a906 nd/submodule-foreach-quiet later to maint).

- "git send-email" has been taught to use quoted-printable when the payload contains carriage-return. The use of the mechanism is in line with the design originally added the codepath that chooses QP when the payload has overly long lines. (merge 74d76a1701 bc/send-email-qp-cr later to maint).

- The recently added feature to add addresses that are on anything-by: trailers in ’git send-email’ was found to be way too eager and considered nonsense strings as if they can be legitimate beginning of *-by: trailer. This has been tightened.

- Builds with gettext broke on recent macOS w/ Homebrew, which seems to have stopped including from /usr/local/include; this has been corrected. (merge 92a1377a2a js/macos-gettext-build later to maint).

- Running "git add" on a repository created inside the current repository is an explicit indication that the user wants to add it as a submodule, but when the HEAD of the inner

repository is on an unborn branch, it cannot be added as a submodule. Worse, the files in its working tree can be added as if they are a part of the outer repository, which is not what the user wants. These problems are being addressed. (merge f937bc2f86 km/empty-repo-is-still-a-repo later to maint).

- "git cherry-pick" run with the "-x" or the "--signoff" option used to (and more importantly, ought to) clean up the commit log message with the --cleanup=space option by default, but this has been broken since late 2017. This has been fixed.

- When given a tag that points at a commit-ish, "git replace --graft" failed to peel the tag before writing a replace ref, which did not make sense because the old graft mechanism the feature wants to mimic only allowed to replace one commit object with another. This has been fixed. (merge ee521ec4cb cc/replace-graft-peel-tags later to maint).

- Code tightening against a "wrong" object appearing where an object of a different type is expected, instead of blindly assuming that the connection between objects are correctly made. (merge 97dd512af7 tb/unexpected later to maint).

- An earlier update for MinGW and Cygwin accidentally broke MSVC build, which has been fixed. (merge 22c3634c0f ss/msvc-path-utils-fix later to maint).

- %(push:track) token used in the --format option to "git for-each-ref" and friends was not showing the right branch, which has been fixed. (merge c646d0934e dr/ref-filter-push-track-fix later to maint).

- "make check-docs", "git help -a", etc. did not account for cases where a particular build may deliberately omit some subcommands, which has been corrected.

- The logic to tell if a Git repository has a working tree protects "git branch -D" from removing the branch that is currently checked out by mistake. The implementation of this logic was broken for repositories with unusual name, which unfortunately is the norm for submodules these days. This has been fixed. (merge f3534c98e4 jt/submodule-repo-is-with-worktree later to maint).

- AIX shared the same build issues with other BSDs around fileno(fp), which has been corrected. (merge ee662bf5c6 cc/aix-has-fileno-as-a-macro later to maint).

- The autoconf generated configure script failed to use the right gettext() implementations from -libintl by ignoring useless stub implementations shipped in some C library, which has been corrected. (merge b71e56a683 vk/autoconf-gettext later to maint).

- Fix index-pack perf test so that the repeated invocations always run in an empty repository, which emulates the initial clone situation better. (merge 775c71e16d jk/p5302-avoid-collision-check-cost later to maint).

- A "ls-files" that emulates "find" to enumerate files in the working tree resulted in duplicated Makefile rules that caused the build to issue an unnecessary warning during a

trial build after merge conflicts are resolved in working tree *.h files but before the resolved results are added to the index. This has been corrected.

- "git cherry-pick" (and "revert" that shares the same runtime engine) that deals with multiple commits got confused when the final step gets stopped with a conflict and the user concluded the sequence with "git commit". Attempt to fix it by cleaning up the state files used by these commands in such a situation. (merge 4a72486de9 pw/clean-sequencer-state-upon-final-commit later to maint).

- On a filesystem like HFS+, the names of the refs stored as filesystem entities may become different from what the end-user expects, just like files in the working tree get "renamed". Work around the mismatch by paying attention to the core.precomposeUnicode configuration. (merge 8e712ef6fc en/unicode-in-refnames later to maint).

- The code to generate the multi-pack idx file was not prepared to see too many packfiles and ran out of open file descriptor, which has been corrected.

- To run tests for Git SVN, our scripts for CI used to install the git-svn package (in the hope that it would bring in the right dependencies). This has been updated to install the more direct dependency, namely, libsvn-perl. (merge db864306cf sg/ci-libsvn-perl later to maint).

- "git cvsexportcommit" running on msys did not expect cvsnt showed "cvs status" output with CRLF line endings.

- The fsmonitor interface got out of sync after the in-core index file gets discarded, which has been corrected. (merge 398a3b0899 js/fsmonitor-refresh-after-discarding-index later to maint).

- "git status" did not know that the "label" instruction in the todo-list "rebase -i -r" uses should not be shown as a hex object name.

- A prerequisite check in the test suite to see if a working jgit is available was made more robust. (merge abd0f28983 tz/test-lib-check-working-jgit later to maint).

- The codepath to parse :<path> that obtains the object name for an indexed object has been made more robust.

- Code cleanup, docfix, build fix, etc. (merge 11f470aee7 jc/test-yes-doc later to maint). (merge 90503a240b js/doc-symref-in-proto-v1 later to maint). (merge 5c326d1252 jk/unused-params later to maint). (merge 68cabbfda3 dl/doc-submodule-wo-subcommand later to maint). (merge 9903623761 ab/receive-pack-use-after-free-fix later to maint). (merge 1ede45e44b en/merge-options-doc later to maint). (merge 3e14dd2c8e rd/doc-hook-used-in-sample later to maint). (merge c271dc28fd nd/no-more-check-racy later to maint). (merge e6e15194a8 yb/utf-16le-bom-spellfix later to maint). (merge bb101aaf0c rd/attr.c-comment-typofix later to maint). (merge 716a5af812 rd/gc-prune-doc-fix later to maint). (merge 50b206371d js/untravis-windows later to maint). (merge dbf47215e3

js/rebase-recreate-merge later to maint). (merge 56cb2d30f8 dl/reset-doc-no-wrt-abbrev later to maint). (merge 64eca306a2 ja/dir-rename-doc-markup-fix later to maint). (merge af91b0230c dl/ignore-docs later to maint). (merge 59a06e947b ra/t3600-test-path-funcs later to maint). (merge e041d0781b ar/t4150-remove-cruft later to maint). (merge 8d75a1d183 ma/asciidoctor-fixes-more later to maint). (merge 74cc547b0f mh/pack-protocol-doc-fix later to maint). (merge ed31851fa6 ab/doc-misc-typofixes later to maint). (merge a7256debd4 nd/checkout-m-doc-update later to maint). (merge 3a9e1ad78d jt/t5551-protocol-v2-does-not-have-half-auth later to maint). (merge 0b918b75af sg/t5318-cleanup later to maint). (merge 68ed71b53c cb/doco-mono later to maint). (merge a34dca2451 nd/interpret-trailers-docfix later to maint). (merge cf7b857a77 en/fast-import-parsing-fix later to maint). (merge fe61ccbc35 po/rerere-doc-fmt later to maint). (merge ffea0248bf po/describe-not-necessarily-7 later to maint). (merge 7cb7283adb tg/ls-files-debug-format-fix later to maint). (merge f64a21bd82 tz/doc-apostrophe-no-longer-needed later to maint). (merge dbe7b41019 js/t3301-unbreak-notes-test later to maint). (merge d8083e4180 km/t3000-retitle later to maint). (merge 9e4cbccbd7 tz/git-svn-doc-markup-fix later to maint). (merge da9ca955a7 jk/ls-files-doc-markup-fix later to maint). (merge 6804ba3a58 cw/diff-highlight later to maint). (merge 1a8787144d nd/submodule-helper-incomplete-line-fix later to maint). (merge d9ef573837 jk/apache-lsan later to maint). (merge c871fbee2b js/t6500-use-windows-pid-on-mingw later to maint). (merge ce4c7bfc90 bl/t4253-exit-code-from-format-patch later to maint). (merge 397a46db78 js/t5580-unc-alternate-test later to maint). (merge d4907720a2 cm/notes-comment-fix later to maint). (merge 9dde06de13 cb/http-push-null-in-message-fix later to maint). (merge 4c785c0edc js/rebase-config-bitfix later to maint). (merge 8e9fe16c87 es/doc-gitsubmodules-markup later to maint).

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