

Proposal: Migrating Python Linting from Pylint to Ruff in Chromium

1. Executive Summary

Chromium is adopting **Ruff** for Python formatting (crbug.com/40874143), bringing sub-second code formatting to Chromium developers. This proposal details the next step: migrating Chromium's Python linting from legacy **Pylint** to **Ruff**.

To allow teams to adopt Ruff formatting and Ruff linting independently at their own pace, the linter selection is decoupled from formatting configuration. `git cl lint` and presubmit checks will inspect ancestor `PRESUBMIT.py` files to determine whether to run **Ruff** or **Pylint** (and which Pylint version).

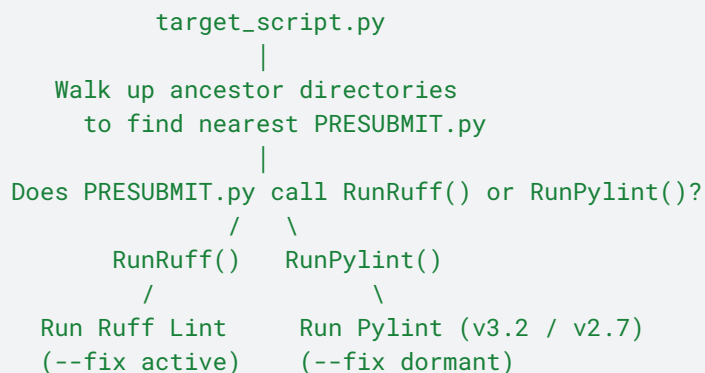
By migrating to Ruff linting, we achieve:

- **Instant lint feedback (<0.5 seconds)** compared to 2–3 minute Pylint presubmit runs.
- **Unified toolchain** (single Rust-backed binary for formatting and linting).
- **Auto-fix capabilities** (`git cl lint --fix`) for common style and import issues.
- **Zero disruption to legacy code** by checking `PRESUBMIT.py` declarations up the tree.

2. Decisioning Mechanism: Inspecting `PRESUBMIT.py`

Rather than tying Ruff linting to `.ruff.toml` formatting configuration, `depot_tools` and `git cl lint` will inspect ancestor `PRESUBMIT.py` files to determine the active linter for each Python file:

None



1. **Ruff-Enabled Directories:** If the nearest ancestor `PRESUBMIT.py` invokes `input_api.canned_checks.RunRuff(...)`, `git cl lint` and presubmit checks invoke **Ruff**. The `--fix` flag is enabled for auto-correcting fixable issues.
 2. **Legacy Pylint Directories:** If the nearest ancestor `PRESUBMIT.py` invokes `input_api.canned_checks.RunPylint(...)`, `git cl lint` invokes **Pylint**, preserving the declared version (`version='3.2'` or legacy 2.7). The `--fix` flag remains dormant for Pylint.
 3. **Separation of Formatter and Linter:** Making presubmit linter selection explicit via `PRESUBMIT.py` ensures that enabling Ruff formatting via `.ruff.toml` does not forcibly flip the linter until the directory owners are ready to migrate their `PRESUBMIT.py`.
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3. Modernizing `git cl lint` and Presubmit UX

Currently, `git cl lint` is hardcoded to legacy `cpplint`. We propose extending `git cl lint` to serve as the standard local linter endpoint for all language types:

- **C/C++ (.cc, .h):** Runs `cpplint`.
- **Python (.py):** Checks ancestor `PRESUBMIT.py` to run **Ruff** or **Pylint**.
- **Auto-Fix Support:** Only Ruff can perform auto-fixing, so `git cl lint --fix` will run `ruff check --fix` for Ruff-enabled files while staying dormant for Pylint.

Presubmit Failure Hint

When a Python presubmit lint check fails during `git cl presubmit` or `git cl upload`, the presubmit output will include a clear user hint:

None

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Lint errors found in affected files.  
Hint: Run 'git cl lint' to re-run lint checks locally,  
and run 'git cl lint --fix' to auto-fix detected issues.  
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4. Migration & Rollout Plan

1. **Phase 1 (depot_tools Support):**

- Add `canned_checks.RunRuff(...)` to `presubmit_canned_checks.py`.
- Update `git cl lint` (CMDlint) in `git_cl.py` to inspect ancestor `PRESUBMIT.py` for linter selection and support `--fix`.
- Add presubmit failure hint.

2. Phase 2 (Directory Opt-in):

- Directory owners switch their `PRESUBMIT.py` from `RunPylint` to `RunRuff` when ready.
- Run a bulk-suppression pass if necessary to create a clean baseline.

3. Phase 3 (Legacy Pylint Deprecation):

- As `PRESUBMIT.py` migration reaches 100% of Chromium directories, deprecate Pylint in `depot_tools`.

5. Addendum: Why Ruff Over Pyrefly for Linting?

While **Pyrefly** is an excellent modern static type checker (designed to replace Pytype), **Ruff** was specifically chosen as the primary linter replacement for Pylint due to several key differences in scope and capabilities:

1. Linter vs. Type Checker Domain:

- **Ruff** is a dedicated linter and formatter. It checks code style, syntax rules, unused imports/variables, docstrings, and refactoring guidelines (providing direct parity with Pylint's `PL` ruleset).
- **Pyrefly** is a flow-sensitive type checker (similar to Pyright or Mypy). It analyzes type annotations and type inference, rather than general lint/style rules.

2. Auto-Fix Functionality (`git cl lint --fix`):

- Ruff features native, sub-millisecond **auto-fixing** (`ruff check --fix`), allowing developers to automatically resolve fixable lint errors (e.g., unused imports, quote choices, formatting).
- Pyrefly does not auto-fix code style or lint errors; it reports type mismatches.

3. Single Binary & Shared Configuration:

- Chromium has already integrated Ruff for Python formatting (crbug.com/40874143). Adopting Ruff for linting reuses the existing `ruff` binary wheel in CIPD ([infra/python/wheels/ruff](#)) and shared `.ruff.toml` config, minimizing infrastructure overhead.

4. **Complementary Roles:**

- Ruff and Pyrefly are non-competing, complementary tools. Ruff serves as the instant style/lint checker, while Pyrefly can be adopted separately for strict type checking.