NUMPY 2.0 AMA

WITH NATHAN GOLDBAUM, QUANSIGHT LABS

NUMPY 2.0 Planning

NumPy 2.0 Developer Meeting:
April 3, 2023

Proposed and discussed major projects that went into NumPy 2.0

Time	Topic	Facilitators/persons responsible/moderators
3pm UTC	Intro	Ralf
3:10pm UTC	C API and ABI changes	Sebastian & Matti
4:25pm UTC	A thorough cleanup of the Python API	Stéfan & Ralf
5pm UTC	Finalizing NEP 50 (scalar type promotion)	Sebastian
5:30pm UTC	Add array API standard support to the main namespace	Ralf & Aaron
6pm UTC	Smaller topics on the roadmap: 3-6 minute lightning talks (record, no questions but async feedback)	Moderator: Melissa
6:30pm UTC	Rollout: communications, deprecations, tools to upgrade - open discussion	Moderator: Inessa

NEPs and Roadmap

https://numpy.org/neps/index.html

Major changes to NumPy happen as a result of a formal design and consensus-finding process.

NumPy NEPs:
https://numpy.org/neps/

Roadmap & NumPy enhancement proposals

This page provides an overview of development priorities for NumPy. Specifically, it contains a roadmap with a higher-level overview, as well as NumPy Enhancement Proposals (NEPs)—suggested changes to the library—in various stages of discussion or completion (see NEP 0).

Roadmap

The Scope of NumPy

Current roadmap

Wish list

NumPy enhancement proposals (NEPs)

Meta-NEPs (NEPs about NEPs or active Processes)

- NEP 0 — Purpose and process
- NEP 23 — Backwards compatibility and deprecation policy
- NEP 36 — Fair play

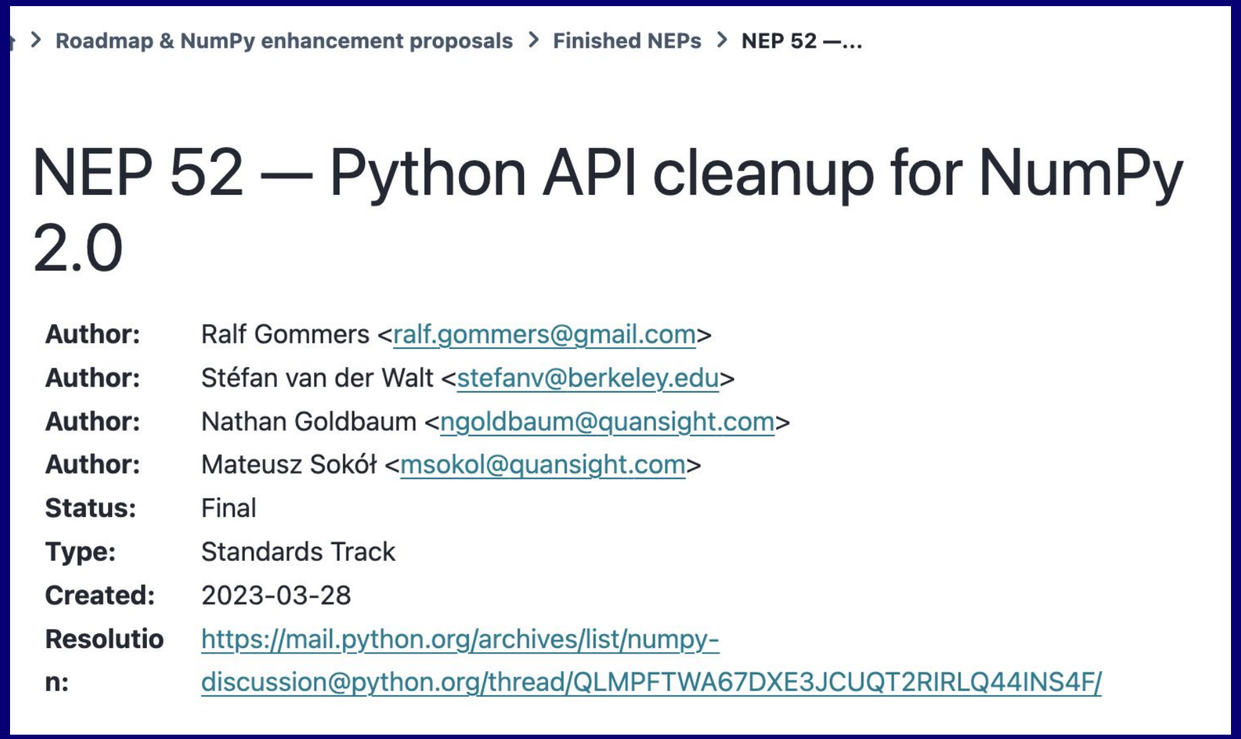
NUMPY 2.0

HIGHLIGHTS

- Streamlined Python API
- Improved scalar promotion rules
- Powerful new DType API and a new string dtype
- Windows compatibility enhancements
- Support for the Python array API standard

Python API Cleanup

- Cleanup of public/private API distinction
- Remove duplicates, synonyms
- Add testing so we know when we add new things to the public Python API



> Roadmap & NumPy enhancement proposals > Finished NEPs > NEP 52 —...

NEP 52 — Python API cleanup for NumPy 2.0

Author:	Ralf Gommers <ralf.gommers@gmail.com>
Author:	Stéfan van der Walt <stefanv@berkeley.edu>
Author:	Nathan Goldbaum <ngoldbaum@quansight.com>
Author:	Mateusz Sokół <msokol@quansight.com>
Status:	Final
Type:	Standards Track
Created:	2023-03-28
Resolution:	https://mail.python.org/archives/list/numpy-discussion@python.org/thread/QLMPFTWA67DXE3JCUQT2RIRLQ44INS4F/

New DType API

- You can write flexible user-defined DTypes!
- New variable-width string DType
- See my talk *My NumPy year* at SciPy 2024

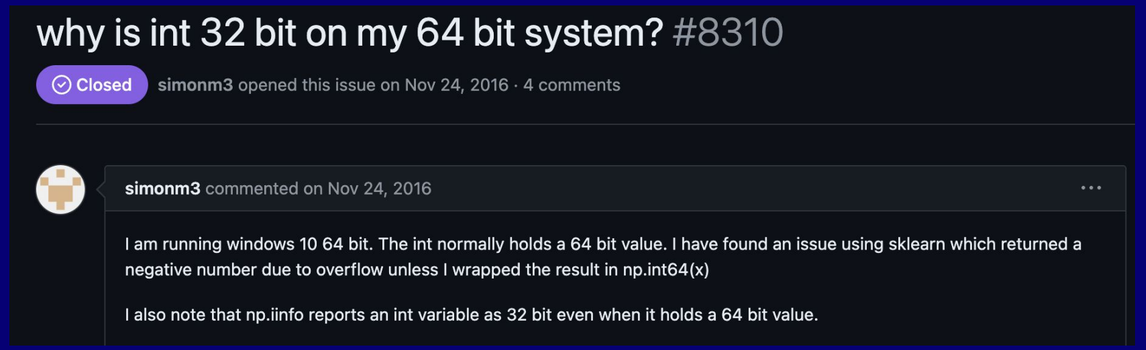
NEP 55 — Add a UTF-8 variable-width string DType to NumPy

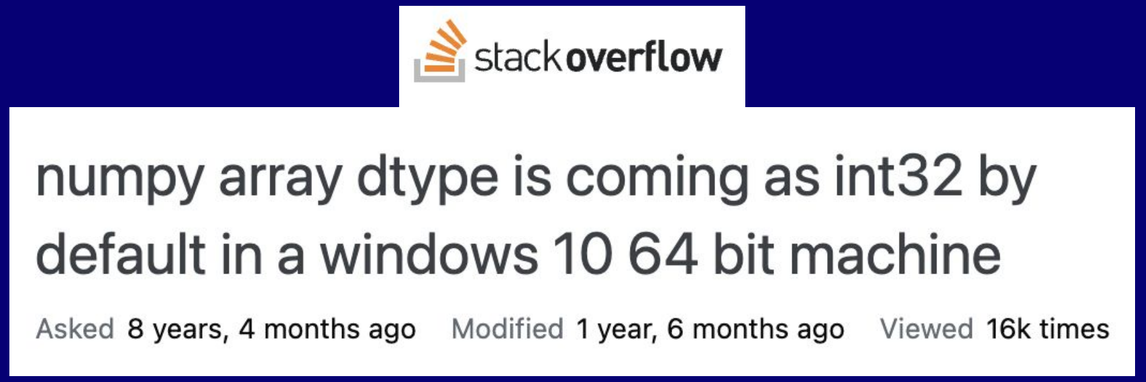
Author: Nathan Goldbaum <ngoldbaum@quansight.com>
Author: Warren Weckesser
Author: Marten van Kerkwijk

Status: Final
Type: Standards Track
Created: 2023-06-29
Updated: 2024-01-18
Resolution: https://mail.python.org/archives/list/numpy-discussion@python.org/thread/Y5CIKBZKMIOWSRYLJ64WV6DKM37QR76B/

Windows Compatibility

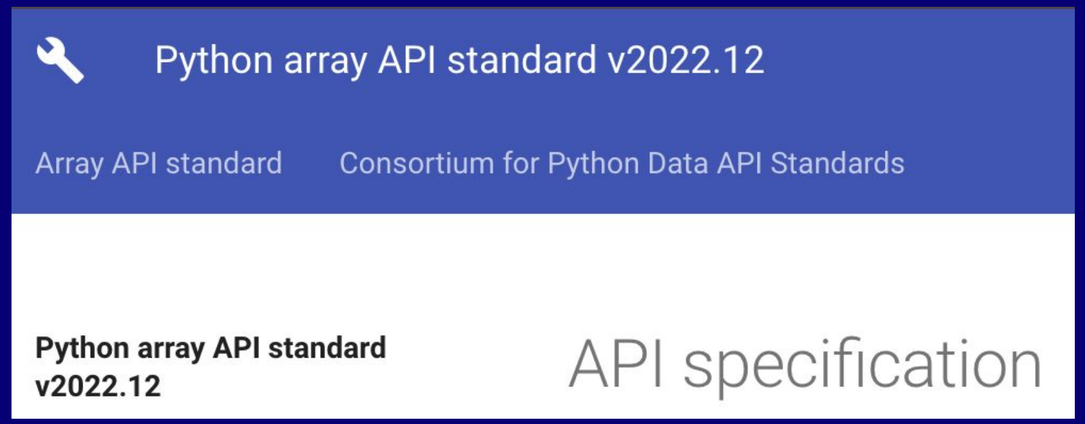
- The default integer on 64 bit Windows is now Int64.
- Solves the #1 Windows compatibility issue in the scientific Python ecosystem





Array API support in the main namespace

- Support for 2022.12 Array API Standard
- Array API support makes it much easier to prototype code with NumPy and then switch to a GPU tensor library
- Easier for libraries to support GPU-backed array libraries



CONNECT WITH NUMPY TEAM

mailing list

or GitHub

NEWCOMERS' HOURS
biweekly

COMMUNITY CALLS
biweekly

DOCS TEAM
biweekly

TRIAGE CALLS
biweekly

OPTIMIZATION TEAM
every third Monday