# GnuCOBOL, the Free Software Alternative for COBOL!

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GnuCOBOL

A free/libre COBOL compiler

SuperBOL

# Executive Summary

After **twenty years** of development,
the GnuCOBOL free and open-source project
has reached an **industrial maturity**
and can **compete with proprietary offers**
in all environments.

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# Let’s introduce ourselves !

**Fabrice Le Fessant** :

- Founder of OCamlPro
- Researcher at Inria (lang & sys dist) --> 2018
- Open-source: MLdonkey, JoCaml, etc.
- Recent contributor to GnuCOBOL, since 2022

**Simon Sobisch :**

- COBOL developer since 2006
- Contributor to OpenCOBOL since 2008
- GnuCOBOL Project Leader

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# What is COBOL ?

```
IDENTIFICATION  DIVISION.
PROGRAM-ID.     prog.
DATA            DIVISION.
WORKING-STORAGE SECTION.
01 var-string PIC X(20) VALUE "Hello World".
PROCEDURE       DIVISION.
   DISPLAY var-string.
END PROGRAM prog.
```

- 1959 : COBOL Business-Oriented Language

  Latest ISO Standard: January 2023

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# Why COBOL matters ?

- Still used in many big corporations
  - 80 billion lines of code, more than all other lang.
  - 15% more code every year
  - too big to switch to another language
  - fast and reliable

- Mostly Proprietary Ecosystem:
  - Mainframe: IBM
  - PC: MicroFocus (bought Acucobol, CobolIT,...)
  - Fujitsu (both Mainframe and PC)

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# Open-Source Projects

- OpenCOBOL Evolutions
  - GnuCOBOL (translator to C)
    - https://gnucobol.sourceforge.io
  - OpenSourceCOBOL (translator to Java)
    - https://github.com/opensourcecobol/opensourcecobol4j
- New comers
  - GCobol (GCC Frontend)
    - https://cobolworx.com/pages/cobforgcc.html
  - Otterkit (compiler to .net)
    - https://otterkit.com

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# The GnuCOBOL Project

- Evolution of the OpenCOBOL project
  - Created in 2002, renamed as GnuCOBOL in 2013
  - Latest stable release: 3.2 in July 2023
  - Development:
    - Branch gnucobol-3.x
    - trunk for 4.x
- Some numbers on the last 3 years:
  - 13 contributors
  - 460 commits on branch gnucobol-3.x
  - 56k SLOC (runtime), 80k SLOC (compiler)

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# GnuCOBOL Main Features

- Translation from COBOL to C89+
  - Good portability, including several system C compilers
  - Easy interfacing (FFI) with all the Unix/Linux environment
- Standard: Support for ISO Standards of COBOL
  - 97% of NIST tests for COBOL 85
  - No support yet for objects and messages (but maybe soon)
- 19 Dialects: extensions of IBM, MicroFocus, etc.
  - Enable modernization from proprietary without source modification
- Rich ecosystem, with both open-source and proprietary equivalent (SQL preprocessors, CICS, etc.)

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# Industrial Use of GnuCOBOL

- COBOL-IT, early fork of early OpenCOBOL: probably one hundred+ big users
- Objectway Core Banking Suite:
  - AIX / Solaris / RHEL + MicroFocus -> GnuCOBOL/PC
- French DGFIP:
  - GCOS Mainframe -> GnuCOBOL/PC
- Mail on GnuCOBOL-bugs by Realtime Nov 7, 2023:

> [...] We are converting many, many programs from MicroFocus to GNU, and this (ENTER what) is the only problem we can't easily work around. [...]

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# advancements and significant developments

- availability of COBOL source debuggers (based on GDB with different extensions) “no C approach”
- implementation of user tooling (stacktrace, textual dump, coredump, GCC’s coverage and soon coverage to csv) as well as improvements in the ecosystem (sql preparsers, GCSORT)
- ease of availability (distro packagers, binary packages including Win32)
- “supported” use of big COBOL assets put into production, showing necessary areas for improving the compiler and tuning the runtime for performance
- increasing use of free software for analysis (Valgrind, perf, hotspot, rr) - both for GnuCOBOL and applications running GnuCOBOL
- contributors of documentation and test cases
- users (companies and private persons) sponsoring extra features
- commercial support for those that need it (for example per regulation)

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# SuperBOL, a Development Studio for GnuCOBOL

- SuperBOL Studio:
  - VScode extension for COBOL with an LSP server (based on a full COBOL parser in OCaml)
  - GnuCOBOL Documentation in Sphinx format
  - Checker for API COBOL <-> C FFI
- Links :
  - get-superbol.com
  - github.com/OCamlPro/superbol-studio-oss

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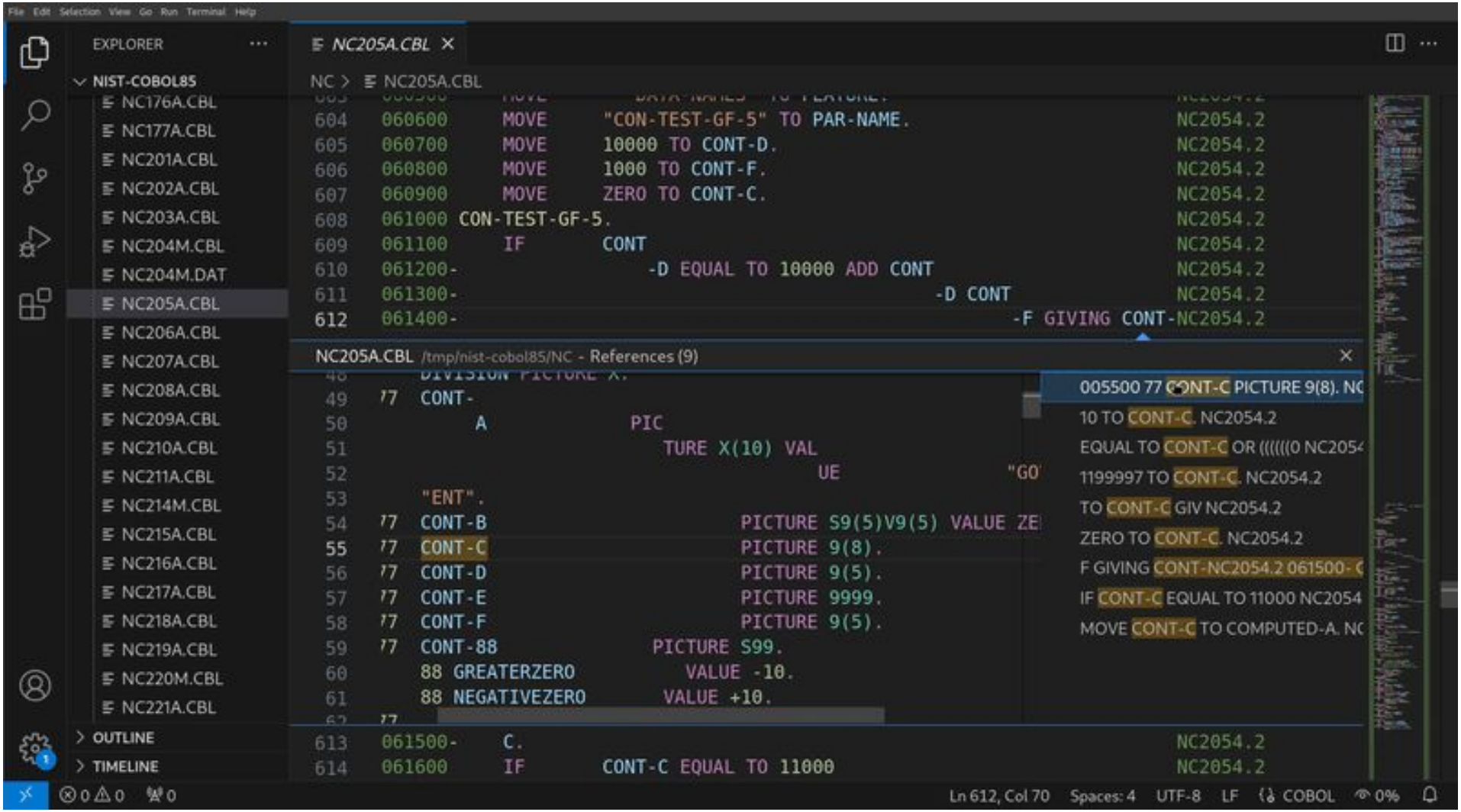

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# Conclusion

- **GnuCOBOL** is now **mature** enough to
  ***compete with COBOL proprietary solutions***

- **SuperBOL Studio** can be used with GnuCOBOL
  ***to develop in a modern environment***

- **Google Summer of Code** on GnuCOBOL:
  https://gnucobol.sourceforge.io/gsoc.html

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