



# XOGastan: XML-Oriented gcc AST Analysis and Transformations

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# Once Upon a Time ...

GCC intermediate data structure were not retained intermediate trees were destroyed as the compilation went on

From release 2.95 (Fall 2001) an interface to access AST structures;

Initially available for C++ (and C).


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# Reengineering Community

Struggle to get robust tool;

GCC is just the perfect candidate to parse C++/C;

- Covers full C++/C
- Ported on all known platforms
- Source code available

Several ongoing efforts:

- CPPX
- GccXFront
- GCCXML


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# Two Alternatives

Modify the GCC interface:

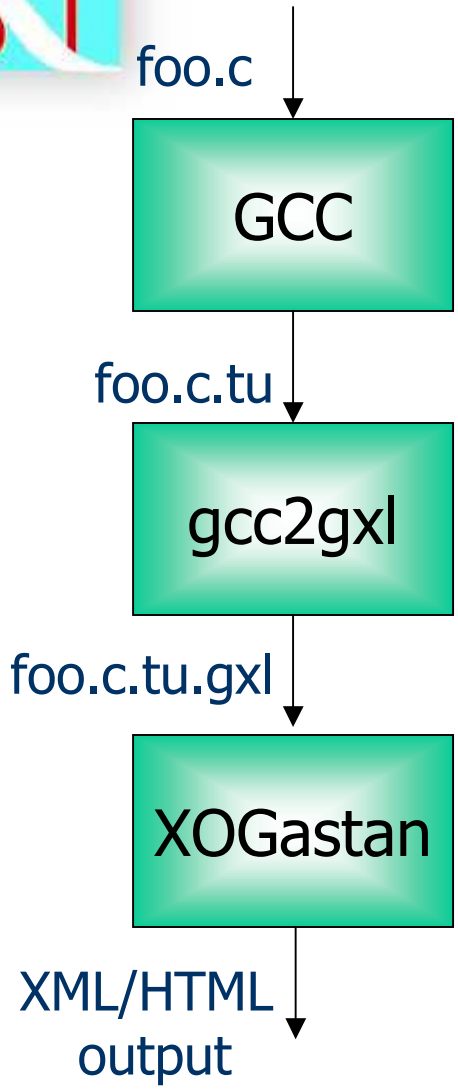
- **pros:** save only the relevant information, fast tool;
- **cons:** complex GCC structure, not clear the impact of future GCC evolutions.

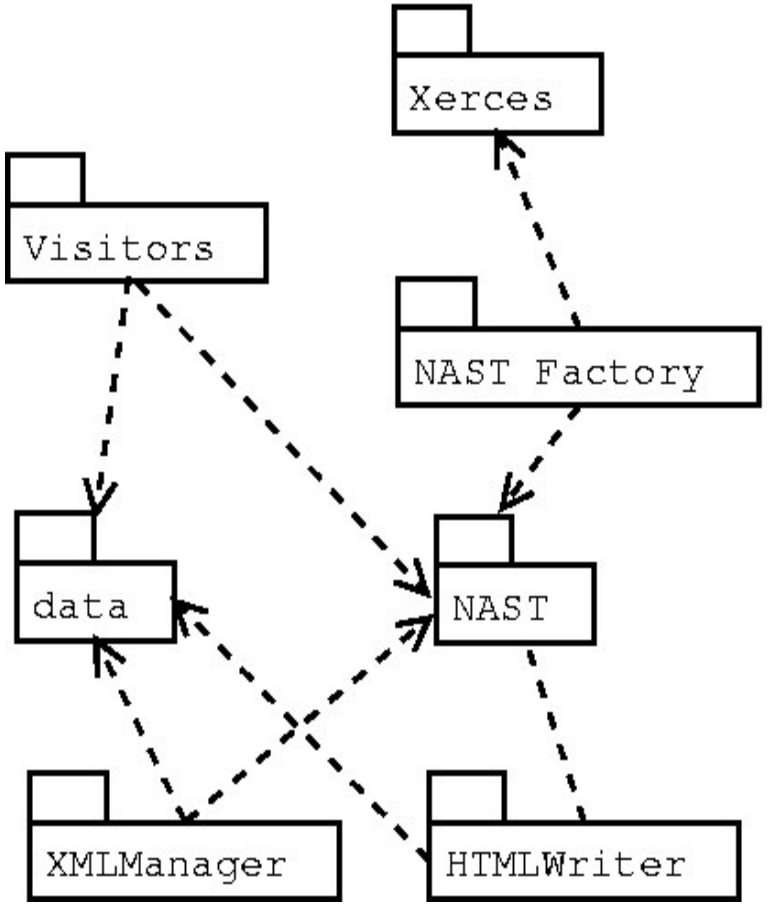
Write a filter parsing GCC AST output:

- **pros:** does not touch GCC files, GCC evolution largely irrelevant;
- **cons:** slower, information is discarded by the filter not at the compiler level.



# Hybrid Pipe-Filter/OO Architecture

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# The Components

- A Perl script parses GCC output and generates a GXL format:
  - irrelevant information may be filtered out at this stage;
- XOgastan analyzes and transforms the GXL input generating XML or HTML output


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# HTML Output Example

XOgastan REPORTS: shell_sort - Konqueror

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**Variables used by the function**

List of the variables used by the function.
We have a short description of each declaration :

1. Is a local decl ?
2. The line in the source file where is defined
3. The qualifiers
4. The type
5. The name
6. The number of *
7. The number of []

| What | Line | Qual. | Type | Name | * | [] |
|---|---|---|---|---|---|---|
| local var | 53 | | int | i | 0 | 0 |
| local var | 53 | | int | j | 0 | 0 |
| local var | 53 | | int | k | 0 | 0 |
| local var | 52 | | int | n | 0 | 0 |
| local var | 55 | | int | pos | 0 | 0 |
| local parm | 51 | | int | riemp | 0 | 0 |
| local var | 53 | | int | t | 0 | 0 |
| local var | 54 | | int | temp | 0 | 0 |