

Tal2c 

Product Overview

Version 3.3  
19 February 2009

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## Acknowledgements

TAL2C is based in part on Sather libraries distributed free of charge by the International Computer Science Institute, 1947 Center Street, Suite 600, Berkeley, CA 94706 and which may be obtained by anonymous ftp from [icsi.berkeley.edu](ftp://icsi.berkeley.edu).

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## 1 Introduction

TAL2C™ is a software product that converts programs written in Transaction Application Language (TAL) to ANSI/ISO Standard C. This document provides an overview of TAL2C.

This document complements the *TAL2C User's Guide*, which discusses how to install, get started with, configure, execute, license, and use TAL2C.

### 1.1 Audience

This document is intended for potential users of TAL2C. It is designed to help you assess whether TAL2C will perform the TAL to C conversion projects required by your organization.

### 1.2 Prerequisites

You do not need to know anything about TAL2C before reading this document. However you will find it helpful to have an understanding of both TAL and C to appreciate the features and benefits of TAL2C.

You may find it useful to read the TAL2C FAQ before you start using TAL2C.

### 1.3 More Information

For more information about TAL2C refer to the *TAL2C User's Guide* and *TAL2C FAQ*.

### 1.4 How to Contact Gresham

Email: tal2c@gresham-computing.com  
Web: <http://www.gresham-computing.com>  
Post: PO Box 6409, North Sydney, NSW, 2060, Australia  
Street: Level 3, 90 Mount St, North Sydney, NSW, 2060, Australia  
Phone: +61 (0)2 9955 7660  
Fax: +61 (0)2 9955 7687

### 1.5 Notation Conventions

This document uses the following notation conventions:

- |                        |  |
|------------------------|--|
| <b>Strong</b> type     | Indicates a significant word or concept, or a note or caution.   |
| <i>Emphasized</i> type | Indicates the name of another document.  |
| Fixed font             | Indicates a TAL or C language construct or code example. For clarity, lengthy code examples are enclosed in boxes. |

## 2 From TAL to C--The Reasons Why

As a loyal NonStop customer you may have invested significant time, money, and skilled programming resources into developing TAL applications. Your TAL applications work well and are designed to support your current business strategies. Why then would you consider converting applications from TAL to another programming language such as C/C++? This chapter discusses some reasons why.

### 2.1 TAL is a Mature Product

Ever since the D40 release of the NonStop Kernel, the TAL compiler has been a functionally stable (mature) product.

This means that language constructs to handle future hardware platforms or software products (for example, extensions for SQL) will generally not be considered. For this reason, TAL is an unattractive language for new software development.

TAL does not generate native RISC or Itanium object code directly. This means that TAL users must undergo the inconvenience of an acceleration stage after compilation to produce object code for current RISC and Itanium platforms. Acceleration can require significant elapsed time and CPU consumption, and is avoidable by converting your source code from TAL.

pTAL and C/C++ are the only comparable NonStop compilers that produce native object code directly on all platforms, including Itanium, obviating the need for additional object code conversion stages.

In addition, because pTAL and C/C++ are native-mode compilers, they produce object code that potentially performs better than accelerated code. Depending on whether programs are I/O-intensive or CPU-intensive, the performance gains achieved by using native mode compilation could be significant.

It makes sense therefore to consider converting your TAL code to either pTAL or C/C++.

### 2.2 pTAL is a Proprietary Language

Your first option might be to consider converting your existing TAL code to pTAL. pTAL is NonStop's proprietary replacement for TAL and is unique to NonStop servers. pTAL was designed specifically to meet the needs of new NonStop hardware. A new pTAL compiler exists for the Itanium servers.

However converting from TAL to pTAL has six main disadvantages:

- Conversion is manual. There are no products available to (even partially) automate conversion. Therefore the process could be laborious and time-consuming.
- If you ever change the base source and want to re-convert you have to manually reconvert all code that has changed or has been affected by a change (e.g. sourced in files). Because TAL2C converts programmatically, its conversion process is repeatable and dependable.
- Conversion to pTAL is likely to bring benefits only if you are developing system software for execution in the Guardian environment on NonStop platforms. You may want to do this to take advantage of pTAL's platform-specific semantics. But your programs will only ever be runnable on NonStop platforms.
- It is unlikely to be your best business strategy, especially if you consider important factors, such as being able to easily hire experienced programmers and running your code on other platforms.

- pTAL does not support embedded SQL.
- pTAL is not fully supported (with color syntax highlighting etc) in development tools from the wider community such as ETK and Eclipse (although Gresham's TOP product does have syntactic support for pTAL and TAL).

### 2.3 C is an Industry-Wide Language

Your second option would be to convert your existing TAL code to C/C++. C is an industry-wide programming language defined by international standards and commonly used on all popular platforms. It is available, for example, on NonStop servers, Windows platforms, and Unix.

Converting from TAL to C/C++ has four main advantages:

- C is a ubiquitous programming language. You have the potential therefore to reduce support and development costs by being able to more easily hire experienced programmers.
- You can leverage the value of your programs by using them on multiple platforms. You can migrate entire applications to Windows or Unix. Alternatively you may want to convert only parts of an application or just some useful algorithms.
- Using C/C++ is consistent with HP's strategic direction. HP's Itanium-based NonStop servers incorporate a common chip used on its other hardware platforms. C/C++ is supported in these environments and common compilers and development technology is used, based on industry standard languages. Such common tools rarely support a proprietary language such as TAL.
- You can use TAL2C, a fast 32-bit TAL compiler with a C code generation backend to automatically convert your TAL source code to C source code. The output produced can be used directly by the NonStop C/C++ compiler.

### 3 Introducing TAL2C

This chapter provides an overview of TAL2C and describes the features and benefits of the product.

#### 3.1 Overview of TAL2C

TAL2C is a fast 32-bit TAL compiler with a C code generation backend that runs under some 32-bit Windows operating systems. It takes TAL source code and automatically converts it to C output code. Depending on CPU speed TAL2C can convert thousands of lines per second.

TAL2C is more intelligent than a simple text converter. It understands TAL semantics including many of the subtle differences between TAL and C, enabling you to preserve the logic of your TAL code in the C output code. The C code it produces can be used directly by the NonStop C/C++ compiler. For example, TAL2C:

- Converts subprocs into individual C procedures
- Supports the CASE expression, group comparisons, and virtually all standard TAL functions
- Supports TAL equivalencing as C unions
- Supports TAL's unsigned bit arrays
- Converts DEFINE names to uppercase and everything else to lower case

TAL2C retains the structure of the TAL source files and the appearance of the TAL code listing wherever possible. As a result, the C output code is recognizable by the original TAL programmer(s), and easily maintainable by C programmers. Comments are also converted and are kept in context.

Finally, TAL2C is simple to obtain, install, configure, and use. No training or consultancy services are necessary to make maximum use of the product immediately.

#### 3.2 Features and Benefits of TAL2C

Some of the more significant features and benefits of TAL2C include the following:

- TAL2C can handle all conversion projects, large or small, with ease.
- For evaluation purposes you can use TAL2C to convert a demonstration program distributed with the product. After assessing the results, you can use the product in a live environment to automatically convert thousands of lines of TAL code. Using TAL2C can save you many hours of laborious hand conversion.
- TAL2C lets you decide how to organize a conversion project.
- You can license TAL2C and perform a conversion yourself. Or you can send the TAL source code to Gresham and receive back compilable source code. Or you can travel to Gresham premises and perform the conversion there. Or Gresham consultants can perform the conversion at your site.
- TAL2C lets you repeat a conversion as often as necessary.
- A conversion can be done in one pass and repeated as often as necessary. Therefore, it is possible to maintain a conversion thread in parallel with other development threads.

- TAL2C has a customizable configuration file.
- The configuration file is used to control the conversion process. Using the configuration file, for example, you can specify any external procedures (library procedures, operating system procedures, and so on) that are to remain in TAL.
- TAL2C produces C code that compiles on any ANSI C or C++ compiler and avoids using NonStop-specific C extensions.
- TAL2C produces portable C code, which means that you can compile the code on many popular platforms, including Windows and Unix. TAL2C also provides switches that let you use some NonStop features.
- TAL2C displays informative error and warning messages during conversion.
- When TAL2C encounters problematic code, these messages can help you to pinpoint the source of the problem.
- TAL2C provides support for embedded NonStop Structured Query Language (SQL) statements and NonStop's Data Description Language (DDL).
- SQL and DDL support enhances the flexibility of TAL2C.
- TAL2C comes with comprehensive and thorough documentation, which is available as a printed manual and in various electronic formats.
- The product documentation enables you to more easily find out how to use the product online or offline.
- TAL2C is fully supported worldwide by Gresham.
- You can obtain prompt assistance from TAL2C experts should you require it.

## 4 Hardware/Software Requirements

This chapter summarizes the hardware and software requirements to install and use TAL2C, and provides some guidelines for estimating the disk space required during a conversion project.

### 4.1 Minimum Installation Requirements

**Hardware** IBM-compatible Pentium 133MHz workstation; 32MB RAM; 10MB disk space; pointing device (such as a mouse).

**Software** Microsoft Windows NT 4.0.

### 4.2 Recommended Installation Requirements

**Hardware** IBM-compatible Pentium 4 workstation; 64MB (or more) RAM; 10MB disk space; pointing device (such as a mouse).

**Software** Microsoft Windows NT 4.0, 2000, XP or Vista.

### 4.3 Conversion Disk Space Guidelines

In addition to the disk space required to install TAL2C, you must have sufficient disk space to convert TAL programs to C programs during a conversion project. It is impossible to say exactly how much disk space you will need because this depends on the size of the TAL program files being converted, and this will vary from project to project.

As a rule, however, using the size of the TAL program files as a starting point, you should ensure that you have at least the same amount of disk space for the C output code, and at least the same amount of disk space again for temporary files used during the conversion process.

In other words, for every 1MB used by your TAL program files (and other required source files), you should ensure that you have at least an additional 2MB of free disk space.

### 4.4 C Compiler Requirements

TAL2C generates ANSI-compliant C source code. To compile your C output code you will need an ANSI-compliant C compiler.

## 5 Obtaining TAL2C

This chapter explains where to obtain TAL2C and suggests what you should do after you obtain the product.

### 5.1 How to Obtain TAL2C

TAL2C is distributed by Gresham as a self-extracting compressed file (for example, `tal2cnnn.exe`, where `nnn` represents a version number such as `11a`). You can obtain an evaluation version of TAL2C by:

- Downloading TAL2C from the Gresham web site.
- Contacting Gresham by email, telephone, fax, or post to request TAL2C on CD.

See "How to Contact Gresham" for the options available to contact Gresham and obtain TAL2C.

The evaluation license for TAL2C is free and is valid for a predetermined period of time. The license agreement allows you to use TAL2C to convert programs distributed with TAL2C so you can begin to evaluate the product. When it expires, download a new version of TAL2C to obtain another evaluation license.

### 5.2 After You Obtain TAL2C

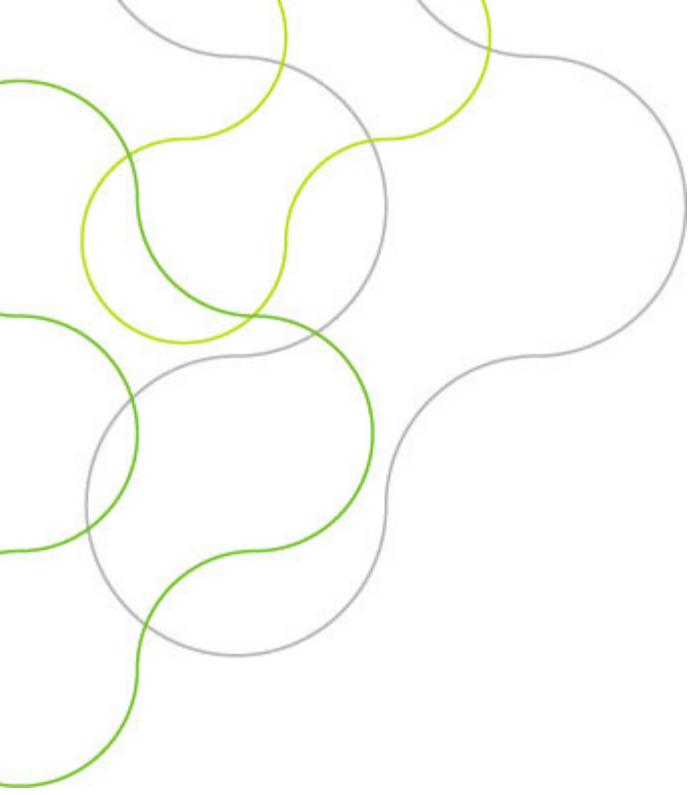
After you obtain TAL2C we suggest that you follow these steps:

- Read the documentation provided with the product, particularly the TAL2C User's Guide and the TAL2C FAQ. These documents explain how to install, configure, execute, and use the product in more detail.
- Install TAL2C. Refer to Chapter 2, "Installing TAL2C," in the *TAL2C User's Guide* for details.
- Test the installation by converting the TAL test program distributed with the product. This program should compile without errors and execute correctly after conversion to C. Refer to Chapter 3, "Getting Started," in the *TAL2C User's Guide* for details.
- Convert the TAL demonstration program distributed with the product. This program is supplied for two reasons. First, to enable you to evaluate TAL2C and to determine whether the product will help you convert your TAL applications to C. Second, so that you can see how easy it is to use TAL2C. Refer to Chapter 3, "Getting Started," in the *TAL2C User's Guide* for details.
- Obtain a production license for TAL2C that enables full use of the product. Refer to Chapter 6, "Licensing TAL2C," in the *TAL2C User's Guide* for details.

## 6 Conversion Constraints

TAL2C can easily convert most TAL code. However, it is important to realize that not all TAL can be converted to C. Conversion difficulties can arise if a program has used hardware-specific TAL features. Structural differences between the languages may also require attention. If your TAL programs do not make use of such features or differences, TAL2C will usually process them first time with no problems.

Refer to Chapter 8, "TAL2C Limitations," in the *TAL2C User's Guide* for details.



## About Gresham

Gresham Computing plc (LSE:GHT) specialises in the provision of real-time financial solutions to banks and corporates, and has a well-deserved reputation for technical excellence, reliability and a strong service culture. Our storage division helps the largest data users to better manage the unrelenting growth of data.

## Further information

For more information on how TAL2C can help your company visit [www.gresham-computing.com](http://www.gresham-computing.com) or you can email us at [tal2c@gresham-computing.com](mailto:tal2c@gresham-computing.com)

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