



HP Education Services

Guardian API Programming for HP NonStop Systems (U4152S)

This course is for C, TAL, and pTAL developers. Learn how to use the Guardian Application Program Interface (API) to obtain operating system services including interprocess communication, process creation, Enscribe file access, and more. This course is 60 percent lecture and 40 percent hands-on labs using HP NonStop servers.

Audience

- Systems programmers
- Application programmers
- Programmer analysts

Prerequisites

- Concepts and Facilities for NonStop Systems (U4147S) and
- TAL/pTAL Programming (U4198S) or C Programming in the Guardian Environment (U4143S)

Course objectives

At the conclusion of this course you should be able to:

- Code for interprocess communication
- Develop applications that access Enscribe files
- Handle terminal input and output
- Identify different types of system messages
- Create and manage new processes
- Available timing facilities
- Know how nowait I/O can be used to improve application performance

Benefits to you

- Learn the functionality of Guardian procedures and Guardian API

Why education services from HP?

- Recognized as an IDC MarketScape leader for IT education (IDC MarketScape: Worldwide IT Education and Training 2012 Vendor Analysis, doc #232870, February 2012)
- Top 20 training provider and content development – www.TrainingIndustry.com
- Unmatched technical expertise and support for HP products and technologies

Course title:	Guardian API Programming for HP NonStop Systems
HP product number:	U4152S
Category/Subcategory:	NonStop / Application Design and Development
Course length:	5 days
Level:	Intermediate
Delivery language:	English
To order:	To review course schedules and to register for a course, visit www.hp.com/learn/nonstop and select your country from the drop down menu, or, contact your HP sales representative or HP authorized channel partner.

- More than 30 years of Education Consulting
- Global training with more than 90 training locations worldwide
- Award winning virtual classrooms and virtual labs for a real hands-on experience

Detailed course outline

Module 0 - Course Overview

Module 1 - Introduction to the Guardian API

- Major functions of the NonStop operating system
- Components of an executing process
- The required function prototype or declaration file for any Guardian procedure
- The NonStop operating system's message-based architecture

- Lab: determine the appropriate procedure to use for a given function, identify the parameter types used by specific procedures and if the procedures return a value or set the condition code

Module 2 - File-System Concepts

- Concept of a file, purpose of an I/O process, and different file name types
- Coding the procedure calls that are common to all file accesses
- Using the DEFINE and ASSIGN functions to equate physical and logical file names
- Coding the procedure calls to perform file-name conversion
- Lab: coding Guardian procedures using the DEFINE capability and the Inspect debugger

Module 3 - Interprocess Communication

- Requester-server model
- Coding the procedures for interprocess communication
- Differences between system and application messages
- TACL startup protocol
- Lab: use \$RECEIVE for message handling and the INITIALIZER or get_startup_msg to handle the TACL startup protocol messages

Module 4 - Enscribe Database Access

- Enscribe file types and coding the procedures to create Enscribe files
- Coding the procedures to access and manage access of any Enscribe file
- Appropriate error checking
- Lab: access an Enscribe key-sequenced data file
- Lab: code programs to perform Enscribe file accessing including adding, updating, and deleting records

Module 5 - Terminal Input and Output

- Determining the home terminal of a process
- Procedures used to write to and read from a terminal in conversation mode
- Errors that can occur during I/O
- Numeric conversions from ASCII to binary and vice versa
- Using the FIXSTRING procedure to support command alteration
- Lab: code a program to determine the process home terminal, perform I/O operations from the home terminal, and send application messages to server processes

Module 6 - Timing Facilities

- Coding the procedures to determine the date and time
- Coding the procedures to schedule events for future execution
- Coding the procedures to measure time intervals

Module 7 - Nowait I/O Processing

- Coding the procedures for nowait I/O operations
- One function of the SETMODE procedure
- Internal and external request management

Module 8 - Process Management

- Calling the procedures to start and manage a process
- Calling the PROCESS_GETINFOLIST_ procedure to obtain information about processes
- HIGHPIN and HIGHREQUESTERS object file flags
- Lab: code a procedure to execute a new process
- Lab (optional): modify a given program to perform nowait I/O on selected files

Module 9 - TS/MP Programming

- Major components of the HP NonStop TS/MP environment
- Pathsend environment and capabilities of a Pathsend requester
- Code calls to the Pathsend procedures
- Code nowait Pathsend operations
- Pathsend error handling
- Design considerations for creating applications using Pathsend
- Design considerations of HP NonStop TS/MP servers

Module 10 - Data Integrity and Application Availability

- Guardian procedure calls to invoke the HP NonStop TMF subsystem
- Using HP NonStop TS/MP subsystem to provide for continuous process availability
- Lab (optional): using Pathsend

For more information

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