



ND 10319 ND-500 Linkage Loader

INTRODUCTION

The ND LINKAGE LOADER (NLL) converts compiler output into executable instructions and data for processing by the ND-500. The compilers and language processors produce ND Relocatable Format (NRF) code. The linkage loader converts NRF code into absolute instructions and data which it places on program and data segments on mass storage (disk). At execution time, the ND-500 Monitor supervises the processing of the programs and data on such segments.

FEATURES

- Libraries may be automatically linked or loaded
- Several libraries may be loaded to the same segment
- Library segments may be reloaded without relinking connected programs
- References on a segment being loaded are linked to entry points on one or more preloaded segments
- Reentrant program segments
- Up to 30 program segments and 30 data segments
- Each segment may be up to 128 MB. Total address space is 4GB for program and the same for data
- Common data (Fortran) may be placed on its own segment(s) and protected especially
- Editor function allows modules on an NRF file to be exchanged, added, removed, etc.
- Existing segments may be modified
- Loader maps may be printed out for all existing segments
- Can be forced to load a complete NRF file (even if the file is a library file)
- Can load only specified modules
- Can exchange modules on an already existing segment

PRODUCT DESCRIPTION

Programs to run on the ND-500 may consist of up to 30 program and 30 data segments, each of up to 128 MB in size. The segments comprising a program are called a domain.

Due to the large address space available for each segment, most users would find one program and one data segment sufficient for running their programs.

Som advantage may, however, be gained by splitting a system into several segments:

- Library segments may be used by many programs, although present only once within the system. This reduces both memory and mass-storage requirements.
- Re-entrant program segments reduce physical memory requirements.
- Individual segments may be protected in different ways – e.g. a read-only data segment prevents important data being destroyed in error.
- Common data may be placed on own segment(s) and thus especially protected.

The simplest process possible consists of one segment in one domain. A segment is built by NLL, on three separate files: one file contains the instructions: the program segment; another contains the data: the data segment; the third contains the names and values of all entry points and optional debug information, and is called the link segment.

The names of segments and domains for each user are found in a file under that user called DESCRIPTION-FILE:DESC. Each named object (segment or domain) has an entry in this file, containing all information needed by NLL and the monitor. For example, the domain entry – one for each domain – contains the name of the domain, a table of the segment files comprising the domain, information about the relationships to other domains, the size and the start address of the domain, and information relevant to the internal operation of the monitor.

Although all domains belonging to a user are described in one file, the same user can access NLL from several terminals simultaneously; NLL will resolve conflicts. If attempts are made to modify the same domain from two terminals simultaneously, one of the users will get an error message.

Information about intermodule references, entry points and symbol values is coded in the file that is output from

compilers. NRF Procedure calls or references to global data – are made through symbols; that is, alphanumeric labels assigned to an instruction or data item. These symbols are made by the language processor (often based on user assigned names in the source program), and are referred to as «entry points».

At execution time, references are made to addresses rather than to symbols. The conversion from relocatable symbols to machine addresses is done by the loader. The loader maintains a table, called the loader table, where symbols are entered as they are encountered.

COMMANDS

All command, domain and segment names may be abbreviated as long as they are unambiguous. Most of the command names follow two rules:

The first word in the command describes the action.

The second word in the command describes the subject the action is going to be taken upon.

If, for instance, the command HELP is used in the following way:

HELP, -SEGMENT

all commands concerning segment manipulation will be printed on the output device.

Linkage Loader commands are of the following kind:

- Domains
- Segments
- Auto-load files
- Auto-link files
- Entry point and reference handling
- Trap handling
- Memory utilization
- Shared ND-100/ND-500 common blocks
- NRF editor

DOCUMENTATION

ND-500 Loader/Monitor ND-60.136.01



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