

NonStop NET/MASTER Tips and Techniques
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Introduction

This is an ongoing column with NonStop NET/MASTER tips and techniques. Each column is also accessible from <http://www.greshamsoftwarelabs.com.au/> (Gresham Software Labs). Please send all comments and suggestions to John New at jnew@greshamsoftwarelabs.com.au.

Biography

John New is a technical writer. He has written and updated various Tandem manuals. He currently writes hard-copy, online, and web documents for a variety of software products.

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NonStop NET/MASTER Tips and Techniques
D-Series NonStop NET/MASTER MS on a C-Series System
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This column is written primarily for users of Tandem systems who are running a C-series NonStop Kernel with a C-series release of NonStop NET/MASTER Management Services (MS). In particular, it is aimed at users whose current business strategy requires that they continue to run a C-series NonStop Kernel but who want to take advantage of the many new features and enhancements available since the release of a recent IPM of NonStop NET/MASTER MS D30. The column discusses some features and benefits of installing a D-series release of NonStop NET/MASTER MS on a C-series system.

Note: This column does not suggest that users should necessarily continue to run a C-series NonStop Kernel.

Background Information

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On 24 August 1992, Tandem released the First Customer Shipment (FCS) version of NonStop NET/MASTER MS. This version (T6581C30) was designed to run on the C30 Guardian 90 operating system.

On 31 October 1994, Tandem released the first version of NonStop NET/MASTER MS designed to run on a D30 NonStop Kernel. NonStop NET/MASTER MS D30 (T6581D30) introduced many new features. However, it was not possible for users running a D20 or C-series NonStop Kernel to install NonStop NET/MASTER MS D30 and to take advantage of these new features.

On 23 March 1995, Tandem released an IPM (T5681AAR) designed to enable users with a D20 NonStop Kernel to run NonStop NET/MASTER MS D30. On 1 February 1996, Tandem released an IPM (T6581ABE) designed to enable users with a C-series NonStop Kernel to run NonStop NET/MASTER MS D30.

NonStop NET/MASTER MS also runs on systems with a D40 NonStop Kernel. Therefore, the same NonStop NET/MASTER MS code base now runs on Tandem systems with a C-series, D20, D30, or D40 NonStop Kernel.

NonStop NET/MASTER MS D30 Features and Benefits

NonStop NET/MASTER MS D30 incorporated many performance enhancements and bug fixes. Some of the most significant benefits now available to users were achieved by:

- o Consolidating NonStop NET/MASTER MS object files
- o Consolidating NCL procedures and panel description files
- o Improving how NonStop NET/MASTER MS loads SPI tokens
- o Making NonStop NET/MASTER MS continuously available

Note: For an analysis of NonStop NET/MASTER MS performance improvements, refer to "NonStop NET/MASTER Performance Report" by Tony Bond, Tandem Connection, Vol. 17, No. 3, 1996, pp.31-34. This performance report is also available to download (as a Microsoft WinWord 6 document) from <http://www.intsoft.com.au/~intsoft/download/nmperf.zip>.

Consolidating NonStop NET/MASTER MS Object Files

Before NonStop NET/MASTER MS D30, the following object files were distributed with the product: NMBK, NMEM, NMIS, NMMS, and NMNC0001. Processes created from these object files handled most NonStop NET/MASTER MS functions. NMBK processes handled most background activity, NMEM processes handled background Event Management Service (EMS) activity, NMIS processes handled links with remote systems, NMMS processes handled activity from interactive users, and NMNC processes handled all the functions supported by the combined NMBK, NMEM, NMIS, and NMMS processes.

Using four separate object files with specialized functions and one object file that consolidated these functions provided users with many installation options. At one end of the installation spectrum, sites with few users, small Tandem systems, or minimum workloads could simply install one NMNC process in a single CPU. At the other end, sites with many users, large Tandem systems, or ever-changing high workloads could distribute NMBK, NMEM, NMIS, and NMMS processes over multiple CPUs. However, the object files used significant disk space because common code was necessarily present in each object file.

Using different object files also failed to realize the potential for code reentrancy when more than one NMBK, NMEM, NMIS, NMMS, or NMNC process was executing in a CPU. Multiple processes are used in extended basic mode and advanced mode. In extended basic mode at least one NMNC process is started and a combination of NMBK, NMEM, NMIS, or NMMS processes are started. In advanced mode, no NMNC processes are started and at least one NMBK, NMEM, NMIS, and NMMS process is started.

Accordingly, the NMNC object file was enhanced. A new startup parameter, PARAM PROCESSCLASS, was introduced to enable users to specify the process class (BK, EM, IS, MS, or NC) created from the single NMNC0001 object file during NonStop NET/MASTER MS startup. Separate NMBK, NMEM, NMIS, and NMMS object files were no longer required.

Consolidating four object files into one enhanced object file significantly reduced disk space requirements. Using code reentrancy reduced physical memory requirements and significantly improved product performance in extended basic mode and advanced mode. Finally, distributing fewer files with the product reduced installation time.

Consolidating NCL Procedures and Panel Description Files

Before NonStop NET/MASTER MS D30, all Network Control Language (NCL) procedures and panel description files were distributed as source code. When a user or NCL process executed a distributed NCL procedure or displayed a distributed panel description file for the first time, the procedure or file was compiled.

Distributing the source code provided users with considerable flexibility to adapt the distributed source code to suit their own system requirements. However, there were more than 350 procedures and files, which used considerable disk space and required significant installation time. Because these procedures and files required compilation when executed during NonStop NET/MASTER MS startup, startup time was slower than necessary.

Accordingly, almost all distributed NCL procedures were combined into a single precompiled NCL object file, and almost all distributed panel description files were combined into a single precompiled panel object file. With the exception of a small number of files that users could customize (including the INIT and READY NCL procedures, and the ZHWKMMNP panel description file), NCL and panel source files were no longer distributed with the product (although they are still available from Tandem if requested). This reduced disk space used, installation time, and startup time.

Note: At the same time, NonStop NET/MASTER Rule Management Services (RMS) distributed NCL procedures and panel description files were combined into a precompiled NCL object file and a precompiled panel object file, respectively,

Improving How NonStop NET/MASTER MS Loads SPI Tokens

Before NonStop NET/MASTER MS D30 the product imported information about every single SPI token at NonStop NET/MASTER MS startup. Thousands of SPI tokens are defined, and token loading was a considerable overhead during initialization.

To shorten startup time, token loading was improved. NonStop NET/MASTER MS now imports very few tokens during startup and loads all other tokens on demand. Because only a small subset of tokens are initially loaded, this change dramatically reduced elapsed startup time and significantly decreased CPU utilization during startup.

This change also improved recovery time when a new BK, EM, IS, MS, or NC process is started after failure, and reduced working set memory while running because fewer tokens are being stored.

Making NonStop NET/MASTER MS Continuously Available

Numerous other features were designed to make NonStop NET/MASTER MS continuously available. These features included the ability to:

- o Manage CPU weight online
- o Manage process weight online
- o Reverse the roles of the primary and backup processes in a process pair

- o Change the backup CPU of a process pair
- o Shut down NonStop NET/MASTER MS without logging on
- o Create persistent NCL processes, that is, automatically restart NCL processes that are prematurely terminated

These features are described in detail in the NonStop NET/MASTER MS manuals.

Installation Considerations =====

Installing NonStop NET/MASTER MS D30 on a C-series system does require minimal changes to installation procedures or files using NonStop NET/MASTER MS D30 startup. First, users are required to delete distributed NCL procedure and panel source files from previous releases. If source files are not deleted, an old NCL procedure, for example, could be compiled and executed instead of a new precompiled NCL object file.

Second, users running NonStop NET/MASTER MS in extended basic mode or advanced mode are required to change process definitions in the NonStop NET/MASTER MS configuration file to include the PARAM PROCESSCLASS command. Pre-D30 process definitions for NC and MS processes might look like the following examples:

```
PARAM PROCESSOBJECT=$SYSTEM.ZNNM.NMNC0001
PARAM PROCESSCPU=(0,1)
PARAM PROCESSPRIORITY=147
PARAM STATICPROCESS=NC_S01
```

```
PARAM PROCESSOBJECT=$SYSTEM.ZNNM.NMMS
PARAM PROCESSPRIORITY=143
PARAM PROCESSWEIGHT=1
PARAM DYNAMICPROCESS=MS_D01
```

The same process definitions, rewritten for D30, would be:

```
PARAM PROCESSOBJECT=$SYSTEM.ZNNM.NMNC0001
PARAM PROCESSCLASS=NC
PARAM PROCESSCPU=(0,1)
PARAM PROCESSPRIORITY=147
PARAM STATICPROCESS=NC_S01
```

```
PARAM PROCESSOBJECT=$SYSTEM.ZNNM.NMNC0001
PARAM PROCESSCLASS=MS
PARAM PROCESSPRIORITY=143
PARAM PROCESSWEIGHT=1
PARAM DYNAMICPROCESS=MS_D01
```

Few other installation changes are required. Complete installation instructions are described in the NonStop NET/MASTER MS T6581ABE softdoc.

Conclusion =====

Installing and using NonStop NET/MASTER MS D30 provides many benefits for users with a C-series NonStop Kernel. It provides better performance, more stability, new functionality, reduced disk space requirements, faster startup time and failover, and is less resource intensive overall.