

Perl 5.8.4 for NetWare®

Developer Kit

June 21, 2006

Novell.

Legal Notices

Novell, Inc. makes no representations or warranties with respect to the contents or use of this documentation, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to revise this publication and to make changes to its content, at any time, without obligation to notify any person or entity of such revisions or changes.

Further, Novell, Inc. makes no representations or warranties with respect to any software, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Novell, Inc. reserves the right to make changes to any and all parts of Novell software, at any time, without any obligation to notify any person or entity of such changes.

You may not use, export, or re-export this product in violation of any applicable laws or regulations including, without limitation, U.S. export regulations or the laws of the country in which you reside.

Copyright © 2005 Novell, Inc. All rights reserved. No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of the publisher.

Novell, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.novell.com/company/legal/patents/> and one or more additional patents or pending patent applications in the U.S. and in other countries.

Novell, Inc.
1800 South Novell Place
Provo, UT 84606
U.S.A.
www.novell.com

Online Documentation: To access the online documentation for this and other Novell developer products, and to get updates, see developer.novell.com/ndk. To access online documentation for Novell products, see www.novell.com/documentation.

Novell Trademarks

For a list of Novell Trademarks, see [Novell Trademark and Service Mark list \(http://www.novell.com/company/legal/trademarks/tmlist.html\)](http://www.novell.com/company/legal/trademarks/tmlist.html)

Third-Party Materials

All third-party trademarks are the property of their respective owners.

Contents

Preface	5
1 Overview	7
1.1 Why is Perl Valuable to NetWare?	7
1.2 What's New	7
2 Getting Started	9
2.1 System Requirements	9
2.2 Installing Perl	9
2.3 Configuring Perl for NetWare	9
2.3.1 Configuring Perl through Apache 2.0	10
2.3.2 Configuring Perl through Command Line	10
2.4 Testing the Configuration	11
2.4.1 Executing Perl Scripts from Web Browser	11
2.4.2 Executing Perl Scripts from Command Line	11
3 Modules and Functions on NetWare	13
3.1 Supported Modules	13
3.1.1 Perl_LDAP	13
3.1.2 DBI 1.43	13
3.1.3 DBD:MySQL 2.9004	13
3.1.4 PerlCGI	14
3.1.5 Perl2UCS	14
3.1.6 Compress::Zlib 1.34	14
3.1.7 XML::Parser 2.34	14
3.1.8 HTML::Parser 3.45	14
3.1.9 Password	14
3.2 Unsupported Modules	14
3.3 Unsupported Functions	15
3.3.1 Unsupported Functions in Standard Modules	15
4 NetWare Specific Notes	17
4.1 General Notes	17
4.2 Using UCS in Perl	17
4.3 Perl Command Line Parameters for NetWare	18
5 Building Perl and Extensions for NetWare	19
5.1 Building Perl 5.8.4 for NetWare	19
5.1.1 Software Requirements	19
5.1.2 Building Perl Interpreter	19
5.2 Building Perl Extensions	20
A Perl Links	21
A.1 Web Pages	21

A.2	Online Guides	21
A.3	Publishers' Web Pages	21

B Revision History 23

B.1	June 2006	23
B.2	October 2005	23
B.3	March 2005	23

Preface

This documentation describes the Perl programming language on NetWare. The guide is divided into the following sections:

- ♦ [Chapter 1, “Overview,” on page 7](#)
- ♦ [Chapter 2, “Getting Started,” on page 9](#)
- ♦ [Chapter 3, “Modules and Functions on NetWare,” on page 13](#)
- ♦ [Chapter 4, “NetWare Specific Notes,” on page 17](#)
- ♦ [Chapter 5, “Building Perl and Extensions for NetWare,” on page 19](#)
- ♦ [Appendix A, “Perl Links,” on page 21](#)

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

A trademark symbol (®, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux or UNIX, should use forward slashes as required by your software.

User Comments

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comment feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

1 Overview

The Practical Extraction and Report Language (Perl) was created by Larry Wall and is designed specifically to process text. It was originally founded on the UNIX platform, and later on was ported onto other platforms. The porting effort required for moving Perl scripts between different platforms is very minimal.

It is a very simple language to learn as Types and Structures are easy to understand. It borrows most of its syntax from C and can be extended in a modular fashion. As a text processor, Perl is especially useful in parsing and report generation. Perl is valuable for both dynamic Web page generation and server task automation.

Perl is categorized as an *open-source language* as the sources are freely available to the programming public. Perl 5.8.4 for NetWare is based on the corresponding Perl open-source code base on CPAN.

The Perl language is maintained and updated by a team of core developers known as the Perl Porters. You can learn about the latest Perl Porters developments by visiting [The Perl Porters Page \(http://www.xray.mpe.mpg.de/mailling-lists/perl5-porters\)](http://www.xray.mpe.mpg.de/mailling-lists/perl5-porters).

1.1 Why is Perl Valuable to NetWare?

Perl offers three main advantages on a NetWare system: CGI (common gateway interface) Scripting, mod_perl interface and System Administration.

CGI scripting is the most common way for a Web server to interact with users. You can use CGI scripting to increase the sophistication and functionality of your Web pages.

mod_perl lets you avoid the overhead of starting an external interpreter and the penalty of Perl start-up time, giving you faster dynamic content.

Since Perl is such a powerful text processor, it has proved to be a valuable system administration tool.

1.2 What's New

The following modules are introduced with this release of NDK

- ◆ Compress::Zlib 1.34 - This module provides a Perl interface to the zlib compression library for in-memory compression/decompression and read/write access to gzip files.
- ◆ HTML::Parser 3.45 - This module parses and validates HTML documents.
- ◆ XML::Parser 2.34 - This module provides methods to parse XML documents. It is built on top of XML::Parser::Expat, which is a lower level interface to Expat library.

2 Getting Started

This section describes the how to install, configure and test Perl on NetWare. These procedures only provide general guidelines. Most of the steps consist of suggested uses and are intended to be viewed as launching points for your Perl projects rather than as solutions to your system needs.

2.1 System Requirements

- NetWare 6.5 with SP3 or later, you can download this from the [Novell Support site \(http://support.novell.com/tools/csp\)](http://support.novell.com/tools/csp)
or
Open Enterprise Server (OES)
- Apache Web Server (version 2.0) for NetWare, you can download this from the [NDK site \(http://developer.novell.com/ndk/apache.htm\)](http://developer.novell.com/ndk/apache.htm), if Perl is to be used with AMP (Apache, MySQL, PHP/Perl) combination.
- Latest UCS binaries, you can download this from the [NDK site \(http://developer.novell.com/ndk/ucs.htm\)](http://developer.novell.com/ndk/ucs.htm)

2.2 Installing Perl

To get the latest version, run the self extracting executable downloaded from the [NDK site \(http://developer.novell.com/ndk/perl5.htm\)](http://developer.novell.com/ndk/perl5.htm). This will overwrite the default Perl installation on NetWare

or

Extract the .zip or tar.gz files on to the NetWare SYS volume.

NOTE: The existing mod_perl.conf file present in the directory sys:/apache2/conf, must be backed up before performing any install related operations to avoid it from being overwritten during the installation process.

2.3 Configuring Perl for NetWare

Perl for NetWare can be configured through the following methods:

- ♦ [Section 2.3.1, “Configuring Perl through Apache 2.0,” on page 10](#)
- ♦ [Section 2.3.2, “Configuring Perl through Command Line,” on page 10](#)

2.3.1 Configuring Perl through Apache 2.0

Perl for Apache 2.0 can be configured in either of the two methods mentioned below:

- ♦ [“Configuring Perl CGI” on page 10](#)
- ♦ [“Configuring mod_perl” on page 10](#)

Configuring Perl CGI

Proceed with the following steps to configure Apache Web server for Perl.

- 1 Open the file `sys:apache2\conf\httpd.conf`.
- 2 Enter the following configuration details in `httpd.conf` file.

```
<IfModule mod_cgi.c>
ScriptAlias /perl sys:\perl\web

CGIMAPExtension sys:/perl/Perl/cgi/Perl/cgi.nlm .pl

</IfModule>
```

NOTE: If the Perl scripts are kept in a different directory enter the corresponding path for `ScriptAlias`.

Configuring mod_perl

Perl works with the Apache Web Server using the `mod_perl` apache module. The configuration for this interface is provided in the `sys:/apache2/conf/mod_perl.conf` file.

To complete the configuration, add the following line in the `sys:\apache2\conf\httpd.conf` file.

```
include sys:\apache2\conf\mod_perl.conf
```

Restarting Apache 2.0

Execute the following command at server console to restart Apache Web Server on completion of the any of the above configurations:

```
ap2webrs
```

2.3.2 Configuring Perl through Command Line

The Perl command line scripts can be executed from the directory of your choice, either by setting the environment variable `PERL_ROOT` or by providing the complete path.

Type the following command at the console prompt:

```
env PERL_ROOT=SYS:\USER_DIRECTORY
```

where, `USER_DIRECTORY` is the directory where you have placed your scripts.

By default, the Perl scripts are placed in `SYS:/PERL/SCRIPTS` directory.

2.4 Testing the Configuration

After configuring Perl, test the configuration through the following steps:

2.4.1 Executing Perl Scripts from Web Browser

- 1 To execute a script, the script or the subdirectory containing the script should be present in the `sys:\perl\web` directory.

To execute the samples in the `sys:\perl\webdemo` folder, copy them to the `sys:\perl\web` directory.

- 2 Enter the URL, in the form of `'http://Server_name:port_number/perl/scriptname'`

For example, the URL for executing the script `env.pl` located under `sys:\perl\web\perlscripts` will be

```
http://server_name:port_number/perl/perlscripts/env.pl
```

If the setup is correct, information about environment variables is displayed in the browser.

2.4.2 Executing Perl Scripts from Command Line

- 1 The Perl sample scripts are available in the `sys:\perl\scripts` folder.
- 2 Execute the following command at the server console

```
perl <scriptname>
```

Example:

```
perl hello.pl
```

The above command opens a perl screen and displays the output. Press any key to close the screen.

By default, Perl will try to locate the script to be executed in `sys:\perl\scripts` or in `PERL_ROOT` if set. To execute scripts in any other locations specify the full path of the file or set the `PERL_ROOT` accordingly.

3 Modules and Functions on NetWare

This section lists modules and functions applicable to Perl 5.8.4 on the NetWare environment.

The latest Perl Specification is available at [Distributed Perl documentation page \(http://www.perl.com/pub/q/documentation\)](http://www.perl.com/pub/q/documentation).

3.1 Supported Modules

The following modules are supported in version 5.8.4 of Perl.

3.1.1 Perl_LDAP

Perl_LDAP modules provide programmers with an interface to perform complex operations on LDAP directories with minimal Perl code.

The Perl_LDAP modules for the eDirectory™ extensions to provide easy interfaces to access the eDirectory extensions such as `AbortPartitionOperationRequest`, `GetReplicaInfoResponse`.

The existing Perl_LDAP module available from CPAN performs only the standard LDAP operations and does not support operations specific to Novell® eDirectory extensions.

3.1.2 DBI 1.43

DBI(database independent interface) is the database access API (application programming interface) for Perl. DBI defines a set of functions and variables that provide a consistent database interface independent of the actual database that is being used. DBI also provides a standard interface and framework for the drivers to operate. The drivers contain an implementation of the DBI methods written using the private interface functions of the corresponding database.

The DBI extension for NetWare defines a set of functions and variables that provide a consistent database interface independent of the actual database being used. DBI is just an interface while the drivers such as [DBD:MySQL 2.9004](#) do the real work.

3.1.3 DBD:MySQL 2.9004

DBD:MySQL is the database driver provided as a Perl extension, that enables database support. This driver uses DBI as an interface between the Perl programming language and the MySQL relational database.

3.1.4 PerlCGI

This is a CGI interface for running Perl on NetWare. The purpose of providing this extension is to aid CGI (common gateway interface) programmers. CGI extension allows you to use CGI scripting to interact with users on web servers.

3.1.5 Perl2UCS

You can invoke Novell[®] UCS (universal component system) using Perl2UCS extension. UCS can be used to develop applications to access Novell services. By using a single interface, it can use Java, Java Beans and Classes, Perl, C, and C++ programs to provide Web scripting and server side functionality.

For more details, refer [Universal Component System \(http://developer.novell.com/ndk/ucs.htm\)](http://developer.novell.com/ndk/ucs.htm)

NOTE: Perl install does not include UCS and UCX components. To download UCS and UCX components visit [NDK site \(http://developer.novell.com/ndk/ucs.htm\)](http://developer.novell.com/ndk/ucs.htm)

3.1.6 Compress::Zlib 1.34

This module provides a Perl interface to the Zlib compression library for in memory compression/decompression and read/write access to gzip files.

3.1.7 XML::Parser 2.34

This module provides methods to parse XML documents. It is built on top of XML::Parser::Expat, which is a lower level interface to Expat library.

3.1.8 HTML::Parser 3.45

This module parses and validates HTML documents.

3.1.9 Password

This module reads the data input in password mode.

3.2 Unsupported Modules

The standard modules listed below are currently not supported in Perl 5.8.4 for NetWare.

IPC	PerlIO	POSIX
GDBM_File	NDBM_File	Thread
ODBM_File	db_file	Sigtrap

3.3 Unsupported Functions

Some of the standard Perl functions are not available in the NetWare implementation. Each function listed below is either unavailable or inapplicable in the NetWare environment.

3.3.1 Unsupported Functions in Standard Modules

chown	getpgrp	setgrent
chroot	getppid	setpgrp
endgrent	getpriority	setpriority
exec	getpwnam	symlink
fork	flock	d_alarm
getgrent	getpwuid	syscall
getgrgid	link	times
getgrnam	rewinddir	getnetbyname
getnetbyaddr		

4 NetWare Specific Notes

This section describes the various issues and features that are specific to Perl 5.8.4 for NetWare.

4.1 General Notes

- ♦ The character encoding schemes of Unicode*, except UTF-8, are not supported.
- ♦ The functions `open()`, `system()`, `unlink()`, `mkpath()`, `rmdir()` will look for the file in `PERL_ROOT`, if the complete path of the file is not specified.
- ♦ Loading CLib based NLMs using `system()` and backtick operator will lead to an `abend`.
- ♦ Console alias commands like `modules` cannot be passed to `system()` and backtick operator.
- ♦ It is mandatory to use lexically scoped variables (with help of the `my()` operator) whenever possible for scripts which are executed using `mod_perl`.
- ♦ `Encode::Guess` is not supported.
- ♦ The Perl debugger restart option is not supported.
- ♦ Scripts that introduces infinite loop cannot be terminated.
- ♦ `Ctrl+C` is not supported in Perl.
- ♦ The `SYN_TIME` eDirectory™ attribute returns a string value, but Perl sends double value while setting such attributes representing seconds since 1970.
- ♦ Some of the control keys (such as up and down arrows) might not work when the Perl debugger is invoked from bash shell.
- ♦ The Error UCX component is not supported within PHP script.

4.2 Using UCS in Perl

- ♦ While writing a Perl script using UCS module, you must include the Perl Module, `Perl2UCS.pm` (formerly `UCSExt`) in the Perl script as follows:

```
use Perl2UCS;
```

Use the new method to create a Perl object for a UCS object. Preface this call with the Perl extension (for example, `Perl2UCS -> new`).

```
$server = Perl2UCS->new("UCX:Server");
```

Get and Set

To get or set a property for a UCS object, refer to the following code sample.

```
#get usage
$retVal = $server->{"LanBoards"};
#set usage
$server->{"LoginStatus"}=1;
```

- ◆ To make method calls on the UCS object you have created, make the call as shown below:

```
$retVal = $dir->login(<username>, <password>);
```

- ◆ Perl2UCS scripts do not work under stressful conditions.
 - ◆ Perl scripts invoking Java classes using UCS will fail from bash as JVM cannot be loaded in protected address space.

4.3 Perl Command Line Parameters for NetWare

- ◆ Invoking Java classes through Perl is not supported in CLI
- ◆ Each time you run a Perl script from the console prompt, a new screen comprising the results of the script execution appears.

To prevent a new screen from popping up and to redirect the output to the logger screen, run Perl scripts with the following command.

```
Perl --noscreen <Perl script name>
```

- ◆ To automatically close the Perl screen after script execution, run Perl scripts with the following command:

```
Perl --autodestroy <Perl script name>
```

5 Building Perl and Extensions for NetWare

This section gives instructions for building Perl 5.8.4 for NetWare.

5.1 Building Perl 5.8.4 for NetWare

The following steps describe the process of building Perl on NetWare

5.1.1 Software Requirements

Ensure to satisfy the following requirements before building Perl NLMs.

- Download Linux Cross compiler for NetWare from the [Forge site \(http://forge.novell.com/modules/xfmod/project/?aunixnw\)](http://forge.novell.com/modules/xfmod/project/?aunixnw)
- Download LibC for NetWare from the [NDK site \(http://developer.novell.com/ndk/libc.htm\)](http://developer.novell.com/ndk/libc.htm)

5.1.2 Building Perl Interpreter

- 1 Download the Perl 5.8.4 source code for NetWare from <http://forge.novell.com>
- 2 Extract the source files using this command.

```
tar zxvf perl-5.8.4-source.tar.gz
```

- 3 Change the following environment variables according to your setup in the 'buildnlm' shell script

```
LIBC='/home/user/libcsdk' environment variables
export LIBC

PATH=/home/user/cross/bin:/home/user/cross/bin:$PATH

DESTDIR='/home/workarea/perlbinaries'
export DESTDIR

PERL_SRC='/home/workarea/perlsources'
export Perl_SRC
```

- 4 Copy MM.pm, MM_NW5.pm and MM_Unix.pm to /usr/lib/perl5/Perl5.8.x/ExtUtils directory. This process will overwrite the above mentioned files, so it is recommended to take a backup of these files.
- 5 Change to NetWare directory and execute the 'buildnlm.sh' script.

This will build the needed binaries.

- 6 After the Perl interpreter and extensions are built, copy the perl and system subdirectories residing under DestDir directory to SYS volume.

5.2 Building Perl Extensions

Follow the instructions mentioned below to build an Perl extension on NetWare platform

- 1 Edit the Makefile.pl and add the following variables for NetWare in the WriteMakefile function.

```
AR=> 'i586-netware-ar'
CC=> 'i586-netware-gcc'
CCCDLFLAGS=> ' ',
CCDLFLAGS=> ' '
DLEXT=> 'nlm'
LD=> 'i586-netware-gcc'
LDDLFLAGS=> '-shared -nostdlib -L'.$ENV{LIBC}.'/lib'
LDLFLAGS=> '-nostdlib -L'.$ENV{LIBC}.'/lib'
OSNAME=> 'NetWare'
OSVERS=> '6.5'
SO=> 'nlm'
FULL_AR=> '/opt/cross/i586-netware/bin/ar'
LIBPERL_A=> 'libperl.nlm'
PERL_SRC      => $ENV{PERL_SRC},
CCFLAGS=> '-nostdinc -fno-builtin -fpcc-struct-return -
DDLOPEN_WONT_DO_RELATIVE_PATHS -DEXPERIMENTAL -DUSEHEAPINSTEADOFSTACK -
DUSE_ITHREADS -D__netware__ -D_POSIX_SOURCE -D__NETWARE__ -
I'.$ENV{LIBC}.'/include'
```

- 2 Execute the following commands

```
Perl Makefile.pl
```

```
make
```

This creates the Makefile and builds the binaries.

NOTE: Some modules downloaded from CPAN may require NetWare related API in order to build for NetWare. Other modules may however build smoothly with or without minor changes depending on the type of module.

A Perl Links

The popularity of Perl has given rise to an abundance of information about programming with Perl and using it with various products. The authoritative Perl text is [Programming Perl \(http://www.oreilly.com/catalog/ppperl3\)](http://www.oreilly.com/catalog/ppperl3) by Larry Wall, Tom Christiansen & Jon Orwant. Links to other resources are provided in the Web Pages section.

A.1 Web Pages

1. [The Perl Home Page \(http://www.perl.com\)](http://www.perl.com)
2. [What's new in Perl 5.8.4 and above \(http://www.perl.com/pub/2000/04/whatsnew.html\)](http://www.perl.com/pub/2000/04/whatsnew.html)
3. [The Perl Manual \(http://stuff.mit.edu/perl/perl.html\)](http://stuff.mit.edu/perl/perl.html)
4. [The Comprehensive Perl Archive Network \(CPAN\) Page \(http://www.perl.com/pub/q/documentation\)](http://www.perl.com/pub/q/documentation)
5. [CGI Made Really Easy \(http://www.jmarshall.com/easy/cgi\)](http://www.jmarshall.com/easy/cgi)
6. [Perl/CGI Resources and Scripts \(http://www.cgiexpo.com/\)](http://www.cgiexpo.com/)

A.2 Online Guides

[Johan Vromans' Perl 5 Reference guide transcribed to HTML by Rex Swain \(http://www.rexswain.com/perl5.html\)](http://www.rexswain.com/perl5.html)

[The Perl Reference Guide \(http://www.squirrel.nl/pub/perlref-5.004.1.pdf\)](http://www.squirrel.nl/pub/perlref-5.004.1.pdf) by Johan Vromans

A.3 Publishers' Web Pages

1. [Accessing Novell Services from Perl on NetWare \(http://support.novell.com/techcenter/articles/ana20001007.html\)](http://support.novell.com/techcenter/articles/ana20001007.html)
2. [Programming on Netware made easy with Perl scripting \(http://support.novell.com/techcenter/articles/dnd19991106.html\)](http://support.novell.com/techcenter/articles/dnd19991106.html)

B Revision History

This section outlines all the changes that have been made to the Perl Admin Guide documentation (in reverse chronological order).

B.1 June 2006

- ♦ Updated the Trademarks list to comply with revised Novell documentation standards

B.2 October 2005

- ♦ Transitioned the existing document to new template
- ♦ Changed date in front file to October 5, 2005
- ♦ Modified [Chapter 1, "Overview,"](#) on page 7
- ♦ Removed warning in ["Configuring Perl CGI"](#) on page 10
- ♦ Modified `mod_lgi` to `mod_cgi` in section ["Configuring Perl CGI"](#) on page 10
- ♦ Modified the contents of the paragraph in [Section 1.1, "Why is Perl Valuable to NetWare?,"](#) on page 7
- ♦ Added a new section [Section 1.2, "What's New,"](#) on page 7
- ♦ Modified the note under [Section 2.2, "Installing Perl,"](#) on page 9
- ♦ Modified the note under [Section 2.3.1, "Configuring Perl through Apache 2.0,"](#) on page 10
- ♦ Added details for [Section 3.1, "Supported Modules,"](#) on page 13
- ♦ Modified details on building Perl and added a new section on [Section 5.2, "Building Perl Extensions,"](#) on page 20
- ♦ Added new NetWare specific issues to existing list under [Chapter 4, "NetWare Specific Notes,"](#) on page 17
- ♦ Updated the links in [Section A.3, "Publishers' Web Pages,"](#) on page 21

B.3 March 2005

- ♦ Added to NDK

