FlexNet Publisher 2023 R2 (11.19.4) Release Notes

May 2023
Revision 01

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Introduction

This Release Notes document summarizes the features, enhancements, and updates delivered with FlexNet Publisher 2023 R2 (11.19.4) in May 2023. The document includes the following information:

- Enhancements
- Security Updates
- Dongle Updates
- Platform Updates
- Resolved Issues
- Known Issues
- System Requirements
- Deprecated Features and Commands
- Legal Information

Enhancements

This release includes the following enhancements:

- Enhanced lmadmin Graphical User Interface
- Introduced macOS 13 Support

Enhanced lmadmin Graphical User Interface

The `lmadmin` graphical user interface has been enhanced to display a borrowed license's expiration date information stored in trusted storage on the `lmadmin` hosts web page, so that the license administrator can easily access this information.

(Case 02218790, FNP-24415)

Introduced macOS 13 Support

In this release, FlexNet Publisher supports the macOS 13 platform. Following are the important highlights in relation with the macOS 13 platform support:

- Certificate based licensing is fully supported on the macOS 13 platform.
- Trusted storage is supported on the macOS 13 platform by adding a new linker flag as a temporary workaround in `makefile` and `makefile.act` under FlexNet Publisher kits. This will be fully supported on the macOS 13 platform for the upcoming releases.

(FNP-27183)

Security Updates

This release includes the following security updates:

- Third-Party Library Updates

Third-Party Library Updates

OpenSSL

The OpenSSL has been upgraded from version 1.1.1s to version 1.1.1t.

(FNP-28471)

OpenLDAP

The OpenLDAP has been upgraded from version 2.6.3 to version 2.6.4.

(FNP-28476)

Apache httpd

The Apache httpd has been upgraded from version 2.4.54 to version 2.4.56.

(FNP-28492)

Dongle Updates

There are no dongle updates to report for FlexNet Publisher 11.19.4.

Platform Updates

This section lists platform updates for the following releases:

- 11.19.4 Updates
- 11.19.3 Updates
- 11.19.2 Updates
- 11.19.1 Updates

11.19.4 Updates

Updates have been made in the following areas for FlexNet Publisher 11.19.4:

- Integrated Products and Tested Versions
- macOS
- Linux OS
- Solaris

- HP-UX

Integrated Products and Tested Versions

The following table lists the integrated products and tested versions for this release.

Product	Tested Version
FlexNet Operations	FlexNet Operations 2022.05 (22.5.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2022 R2 (15.14.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2023.05 (23.5.34)

macOS

Support for macOS 13

FlexNet Publisher supports the macOS 13 platform from FlexNet Publisher release R2, 2023, onwards.

Support for macOS 12.5

FlexNet Publisher supports the macOS 12.5 platform from FlexNet Publisher release R2, 2023, onwards.

Linux OS

End of Life Ubuntu 18.04

FlexNet Publisher no longer supports the the Ubuntu 18.04 platform from FlexNet Publisher release R2, 2023, onwards.

End of Life SUSE Linux 12 SP4

FlexNet Publisher will not support the SUSE Linux 12 SP4 platform from FlexNet Publisher release R3, 2023, onwards.

Solaris

End of Life Solaris 10

FlexNet Publisher will not support the Solaris 10 platform from FlexNet Publisher release R1, 2024, onwards.

HP-UX

End of Life HP-UX

FlexNet Publisher will not support the HP-UX platform from FlexNet Publisher release R4, 2024, onwards.

11.19.3 Updates

Updates have been made in the following areas for FlexNet Publisher 11.19.3:

- Integrated Products and Tested Versions
- Windows OS
- macOS
- Linux OS
- Future of FlexNet Publisher Support for the Windows 32-Bit Kit
- Hypervisor

Integrated Products and Tested Versions

The following table lists the integrated products and tested versions for this release.

Product	Tested Version
FlexNet Operations	FlexNet Operations 2022.05 (22.5.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2022 R2 (15.14.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2023.01 (23.1.32)

Windows OS

End of Support Windows 7 ESU

FlexNet Publisher no longer supports the Windows 7 ESU platform from FlexNet Publisher release R1, 2023, onwards.

macOS

Support for macOS 12.5

FlexNet Publisher will support the macOS 12.5 platform from FlexNet Publisher release R2, 2023, onwards.

End of Life macOS 10.15

FlexNet Publisher no longer supports the macOS 10.15 platform from FlexNet Publisher release R1, 2023, onwards.

Linux OS

End of Support Ubuntu 18.04

FlexNet Publisher will not support the Ubuntu 18.04 platform from FlexNet Publisher release R2, 2023, onwards.

End of Life SUSE Linux 15

FlexNet Publisher no longer supports the SUSE Linux 15 platform from FlexNet Publisher release R1, 2023, onwards.

Future of FlexNet Publisher Support for the Windows 32-Bit Kit

Previously, Revenera announced that support for the FlexNet Publisher Windows 32-Bit kit would end with the 2023 R3 release. After getting feedback from several producers, Revenera decided to continue supporting the 32-bit Windows platform as long as Microsoft is supporting it. If anything changes, Revenera reserves the right to revisit this decision, and give advance notice.

***Note** ▪ The following details our support for the FlexNet Publisher Windows 32-bit kit:*

- *The FlexNet Publisher Windows 32-bit kit will be supported as long as it is supported by Microsoft.*
- *The FlexNet Publisher 32-bit source code is built using Visual Studio 2023. .*
- *Customers can use the 32-bit FlexNet Publisher SDKs and build their project or solution on Visual Studio 2013, Visual Studio 2015, Visual Studio 2017, Visual Studio 2019, or Visual Studio 2022.*

***Note** ▪ FlexNet Publisher no longer supported the 32-bit Windows `lmadmin` from FlexNet Publisher release R2, 2022, onwards.*

Hypervisor

Support for Nutanix AHV

In this release, FlexNet Publisher supports the Nutanix AHV.

***Note** ▪ The following details of support for the Nutanix AHV:*

- *Guest operating systems supported are Windows and Linux.*
- *Supported hostids are VMID and ETHERNET.*

- *No support for GenerationID.*

11.19.2 Updates

Updates have been made in the following areas for FlexNet Publisher 11.19.2:

- Integrated Products and Tested Versions
- Windows OS
- macOS
- Linux OS
- Oracle Java
- Browsers

Integrated Products and Tested Versions

The following table lists the integrated products and tested versions for this release.

Product	Tested Version
FlexNet Operations	FlexNet Operations 2020.01 (20.1.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2021 R1 (15.12.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2022.09 (22.9.34)

Windows OS

End of Life Windows 7 ESU

FlexNet Publisher will not support the Windows 7 ESU platform from FlexNet Publisher release R1, 2023, onwards.

End of Life Windows Server 2016

FlexNet Publisher no longer supports the Windows Server 2016 platform from FlexNet Publisher release R3, 2022, onwards.

macOS

End of Life macOS 10.15

macOS 10.15 (x64_mac10-11.19.3.0_v6.tar.gz) is no longer supported.

Linux OS

Support for RHEL 9

In RHEL9, the LSB component is not offered as part of the supported distribution. Components in FlexNet Publisher, such as lmgrd, require the LSB-loader. If this is not present, lmgrd and other utilities will fail to run with a `No such file or directory` error.

As a workaround, specify a soft link to the native loader. The following symlinks have been verified on RHEL9:

32-bit Linux

```
sudo bash -c "if [ ! -e /lib/ld-lsb.so.3 ]; then ln -s ld-linux.so.2 /lib/ldlsb.so.3; fi"
```

64-bit Linux

```
sudo bash -c "if [ ! -e /lib64/ld-lsb-x86-64.so.3 ]; then ln -s ld-linux-x86-64.so.2 /
lib64/ld-lsb-x86-64.so.3; fi“
```

From 11.13.1.3, the `install_fnp.sh` script will issue a warning if LSB is not detected on the host.

Additionally, this script supports a new `-nolsb` parameter, which sets up the above symlinks.

Oracle Java

End of Support Oracle Java 8

FlexNet Publisher no longer supports Oracle Java 8 from FlexNet Publisher release R3, 2022, onwards.

Browsers

End of Life Microsoft Internet Explorer 11

FlexNet Publisher's `lmadmin` no longer supports the Windows Web browser Microsoft Internet Explorer 11 from FlexNet Publisher release R3, 2022, onwards.

11.19.1 Updates

Updates have been made in the following areas for FlexNet Publisher 11.19.1:

- Integrated Products and Tested Versions
- Windows OS
- Oracle
- lmadmin
- macOS

Integrated Products and Tested Versions

The following table lists the integrated products and tested versions for this release.

Product	Tested Version
FlexNet Operations	FlexNet Operations 2020.01 (20.1.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2021 R1 (15.12.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2022.4 (22.4.41)

Windows OS

End of Life Windows Server 2016

FlexNet Publisher no longer supports the Windows Server 2016 platform from FlexNet Publisher release R3, 2022, onwards.

New FlexNet Publisher Windows kit

A new 64-bit Windows FlexNet Publisher kit has been introduced with suffix _vc16. FlexNet Publisher still supports the default 32-bit & 64-bit Windows FlexNet Publisher kit without the suffix _vc16.

Oracle

End of Life Oracle 8 Support

FlexNet Publisher provides limited support for Oracle 8 in FlexNet Publisher release R2, 2022.

Oracle 8 is no longer supported from FlexNet Publisher release R3, 2022, onwards.

lmadmin

End of Life lmadmin 32-bit

The 32-bit Windows `lmadmin` will no longer supported from FlexNet Publisher release R2, 2022, onwards.

macOS

End of Life macOS 10.14

macOS 10.14 is no longer supported from FlexNet Publisher release R2, 2022, onwards.

Resolved Issues

This release of the FlexNet Publisher Licensing Toolkit resolves the following issues. (Numbers in parentheses indicate the Revenera issue reference number as well as the Salesforce reference number, if applicable.)

- Resolved lmadmin, lmgrd, Vendor daemon, and Utility Issues
- Resolved Issues between Client and License Server
- Resolved General Issues

Resolved lmadmin, lmgrd, Vendor daemon, and Utility Issues

The following issues related to `lmadmin`, `lmgrd`, the vendor daemon, and utilities were addressed in this release:

- Resolved the lmnewgen -p Issue for Prefix Addition
- Resolution for lmadmin Vulnerability

Resolved the lmnewgen -p Issue for Prefix Addition

Execution of `lmnewgen -p` failed to add a prefix in the `lm_new.c` file. This issue has been fixed, now execution of the `lmnewgen -p <vendor>` prefixes the vendor name properly in the `lm_new.c` file.

(Case 02580532, FNP-27058)

Resolution for lmadmin Vulnerability

An external researcher reported a Remote Code Execution (RCE) vulnerability in the lmadmin web user interface, where lmadmin was able to execute a rouge executable that was provided in the lmadmin web user interface. This vulnerability issue has been fixed by making some behavioral changes in the lmadmin and for more details refer *FlexNet Publisher License Administration Guide*.

(Case 02739515, FNP-28285)

Resolved Issues between Client and License Server

The following issues related to the client and license server were resolved in this release:

- Crash During Borrow Checkout
- Issue with the Return Value of lc_checkout
- Incorrect Client Data Issue with the Inactive License

Crash During Borrow Checkout

A crash was observed on the client application, when feature name exceeded 25 characters and version exceeded 10 characters during borrow checkout. This issue has been resolved.

(Cases 02736360, 02736656; FNP-28358)

Issue with the Return Value of lc_checkout

During usage of PACKAGE component features and usage of the **ls_checkout** function in the `ls_outfilter` callback on the server, the **lc_checkout()** function returned 0 value even when licenses were not available on the server. This issue has been fixed.

(Case 02680423, FNP-28663)

Incorrect Client Data Issue with the Inactive License

If a license made inactive through a timeout then the client data populated incorrectly. The fix is provided to retrieve the correct information of the client data (PID value) when reclaiming is done for a TIMEOUT license.

(Case 02741311, FNP-28511)

Resolved General Issues

The following general issues were resolved in this release:

- Build Failure of Universal2_Mac11 Kit
- Resolved Vulnerabilites with libxml2 Upgrade

Build Failure of Universal2_Mac11 Kit

A failure was observed, when building the universal2_mac11 Kit for `makefile.act` on macOS 12.5.1. This issue has been resolved by adding a new linker flag as a temporary workaround in `makefile` and `makefile.act` under FNP kits, which enables the universal2_mac11 kit to be succesfully build on macOS 12 and 13. The actual fix for this issue will be provided in future release.

(Cases 02596949, 02712981; FNP-27500)

Resolved Vulnerabilites with libxml2 Upgrade

The vulnerabilities CVE-2022-40303 and CVE-2022-40304 are fixed by upgrading the libxml2 from version 2.9.14 to version 2.10.3.

(Cases 02726748, 02726003; FNP-27980, FNP-27932)

Known Issues

This release includes known issues in the following categories:

- Known Dongle Issues
- Known lmadmin Issues
- Known Issues Specific to License File–Based Licensing
- Known Issues Specific to Secured Communication

Known Dongle Issues

Backward Compatibility Issue Due to the New Signer

As the SafeNet dongle drivers and its DLL are upgraded to version 8.53 and 8.5 respectively, and also the Wibu dongle drivers are upgraded to version 6.60, the dll signature issuer name is changed from "Symantec" to "DigiCert" on Windows. The same is fixed in FlexNet Publisher's code to handle the new signer. Due to this change, backward compatibility is not possible. If you install latest drivers, old clients will not be able to retrieve the dongle ID.

(FNP-26594, FNP-28216)

Flexid10 Dongle Driver Issue

FLEXID10 dongles may not work correctly with the latest v6.50 driver on VMware hypervisors. This issue has been identified on both Windows and Linux platforms with a dongle connected using a USB passthrough on VMware ESXi and on VMware Workstation. The problem has been reported to Wibu. As a temporary workaround, use the previous version v6.32 driver on VMware hypervisors.

(FNP-17284, FNP-16819)

Wibu Dongle Driver Issue

An error occurs on SUSE 11 SP4 Linux machine while installing a new Wibu dongle driver (V6.50). The problem has been reported to Wibu. As a temporary workaround, use the previous version v6.40 driver.

(FNP-20298)

Dongles in macOS

Dongle drivers are not supported on the macOS platform for FlexNet Publisher release R1, 2023.

(FNP-24876, FNP-24877)

SafeNet Dongle Drivers Support in Linux 32-bit Platform

In FlexNet Publisher release, R1, 2023, the SafeNet dongle drivers with version 8.43 only support the Linux 32-bit platform.

The SafeNet Dongle drivers will not support the Linux 32-bit platform from FlexNet Publisher release, R3, 2023, onwards.

(FNP-28443)

Known lmadmin Issues

lmadmin Silent Installer not Displaying Required Error Message

When a non-root user attempts to install `lmadmin` in the default location, the installer may hang.

(FNP-6942)

Unable to Start lmadmin Services Using CLI in Windows Server 2022

The `lmadmin` services created on Windows 2022 machine is unable to start using command prompt.

(FNP-26481)

lmadmin Login Error Observed in Windows Server 2022

While logging in to `lmadmin` in Windows Server 2022 the error "Old password is incorrect" is seen.

(FNP-26482)

Failed to Install lmadmin with ARM-JDK

Installation of `lmadmin` failed with ARM-JDK on the MAC_ARM platform. This issue can be resolved with a workaround. For `lmadmin` installation, use the following Intel Jdk versions on the MAC ARM platform:

- <=Jdk 17.0.3
- <=Jdk 11.0.15.1

(FNP-29444)

Known Issues Specific to License File–Based Licensing

lmdiag Displaying Incorrect Output when Multiple Vendors are Served by a Single License Server Manager

If multiple vendor daemons are served by a single license server manager (such as lmgrd), lmdiag shows an incorrect error message “No such feature exists” for features that are served by one of the valid daemons.

(FNP-19617; Salesforce case 01202287)

"MAX_CONNECTIONS" Option File Keyword

If a software publisher upgrades only lmgrd and vendor daemon to version 11.16.3 or above, but not the client, the error code that would be received by an older version (version < 11.16.3) client, when MAX_CONNECTIONS limit is exceeded is as follows:

“LM_BADCOMMAND” Error code: “-140” - “A bad command was found in a message”.

(FNP-20537)

Known Issues Specific to Secured Communication

The following issues observed when secure communication has been enabled in between FlexEnabled client and vendor daemon. These issues will be resolved in the future releases of FlexNet Publisher.

- On Windows, the triad configuration with secure communication enabled goes down, if any one of the servers in triad is shutdown/restarted.
  (FNP-26640)
- When multiple vendors run with secure communication enabled under one lmgrd, the secure checkout is possible only for last secured vendor daemon.
  (FNP-26989)

System Requirements

The System Requirements include the following:

- Tested Platforms
- System Requirements for lmadmin

Tested Platforms

The following sections describe the platforms tested with the FlexNet Publisher 2023 R2 (11.19.4) Licensing Toolkits.

- C/C++ Toolkits
- Java Toolkits
- Detailed Platform Information
- Toolkits That Support Prepped Trusted Configuration
- Virtualization
- Tested Cloud Environments

A list of supported platforms can be found here:

https://docs.revenera.com/eol/

C/C++ Toolkits

The following platforms are tested. See the Detailed Platform Information section for more information about each platform.

Table 1 ▪ Tested Platforms—C/C++ Toolkits

Platform Type	Hardware Type	Operating System
AIX 32-bit	PowerPC	AIX 7.1 and 7.2
AIX 64-bit	PowerPC	AIX 7.1 and 7.2
HP-UX 64-bit	Intel Itanium	HP-UX B.11.31 U ia64
Linux 32-bit	x64	RHEL 8 and 9
Linux 64-bit	x64	RHEL 8 and 9 SLES 15 SP3 and SLES 15 SP4 Ubuntu 20.4
Linux 64-bit	ARMv8-A (AArch64)	RHEL 8 SLES 15
macOS/OS X 64-bit	x64	macOS 11.1 macOS 12.1
macOS ARM 64-bit	ARM-64	macOS 11.7.2 macOS 12.1
Microsoft Windows 32-bit	x64	Windows Server 2019 Windows Server 2022 Windows 10 Windows 11
Microsoft Windows 64-bit	x64	Windows 10 Windows 11 Windows Server 2019 Windows Server 2022 It is a best practice to run license servers on a server-based OS.
Solaris 32-bit	SPARC 32-bit x86	Solaris 10 and 11

Table 1 ▪ Tested Platforms—C/C++ Toolkits

Platform Type	Hardware Type	Operating System
Solaris 64-bit	SPARC 64-bit x86-x64	Solaris 10 and 11

Java Toolkits

The following platforms have been tested. See Java Standard Edition in Detailed Platform Information for more information about this platform.

Table 2 ▪ Tested Platforms—Java Toolkits

Platform Type	Hardware Type	Version
Oracle Java Development Kit	• Solaris SPARC 32-bit • Solaris SPARC 64-bit • Windows x86 • Windows x64 • Linux x86 • Linux x64 • macOS x64	Java Standard Edition 1.11 JDK 17

Detailed Platform Information

The following sections list the operating systems and their associated hardware platforms tested with FlexNet Publisher 2023 R2 (11.19.4). Each platform entry contains the following information:

- **Platform name**—The name that identifies this platform when used with the PLATFORMS keyword in a license file.
- **Package identifier**—The name of the toolkit package on Revenera's download site.
- **Tested compiler**—The compiler and version with which this package was tested. Choose a compiler for your development and build environment that is compatible with the one listed.
- **Notes**—Additional platform-specific notes that are useful for developing your FlexEnabled product.
- **Security functionality**—Denotes the level of security functionality your toolkit supports. This information is useful when you implement trusted storage-based licensing in your product. See *Programming Reference for Trusted Storage–Based Licensing* for details.

Click a link to access platform details:

- Microsoft Windows 32-bit
- Microsoft Windows 64-bit

- Linux 32-bit
- Linux 64-bit
- ARMv8-A (AArch64)
- macOS/OS X 64-bit
- macOS ARM 64-bit
- Solaris 32-bit
- Solaris 64-bit
- AIX 32-bit
- AIX 64-bit
- Java Standard Edition
- HP-UX 64-bit

Microsoft Windows 32-bit

The following table lists information about the Microsoft Windows 32-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	i86_n
Package Identifier	i86_n3
Tested Compiler	• Visual Studio 2022 (17.5.4) • Visual Studio 2019 (16.11.26) • Visual Studio 2017 (15.9.51)* • Visual Studio 2015 Update 3* • Visual Studio 2013 Update 5*

Item	Description

Notes	• Multiple Ethernet hostids are supported.
	• Short-code transactions are supported.
	• Prepped Trusted Configuration is supported.
	• Tested virtual machine platforms include:
	VMware Workstation 16.1.2
	VMware ESXi 7
	Microsoft Windows Server 2019 Hyper-V
	Microsoft Windows 10 Hyper-V
	Citrix XenServer 8.2
	Oracle Virtual Box 6.1
	Parallels Desktop 18.0.2 for macOS 12.6
	everRun 7.9.1
	Nutanix AHV (Version 2020.09.16 Community Edition)
	QEMU-KVM (Host OS: CentOS 8)
	  • Hypervisor: qemu-kvm-ev-6.2.0
	  • Hypervisor Services: libvirt-daemon-kvm-8.0.0
	  • Virtual Machine Manager: vmm v3.2.0

Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Note ▪ *The asterisk (*) symbol indicates that the version of the Visual Studio is supported and not tested in the current release.*

Microsoft Windows 64-bit

The following table lists information about the Microsoft Windows 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	x64_n
Package Identifier	x64_n6

Item	Description
Tested Compiler	• Visual Studio 2022 (17.5.4) • Visual Studio 2019 (16.11.26) • Visual Studio 2017 (15.9.51)* • Visual Studio 2015 Update 3* • Visual Studio 2013 Update 5*

Notes	• `lmadmin` is supported using its 64-bit binary. While the 32-bit `lmadmin` binary (contained in the x86_n3 toolkit) continues to be supported on 64-bit systems, Revenera recommends using the 64-bit binary on 64-bit systems.
	• Multiple Ethernet hostids are supported.
	• Short-code transactions are supported.
	• Prepped Trusted Configuration is supported.
	• The `lmtools` utility cannot interact with the license server manager (`lmgrd`) when `lmgrd` is run as a service.
	• Tested virtual machine platforms include:
	VMware Workstation 16.1.2
	VMware ESXi 7
	Microsoft Windows Server 2019 Hyper-V
	Microsoft Windows 10 Hyper-V
	Citrix XenServer 8.2
	Oracle Virtual Box 6.1
	Parallels Desktop 18.0.2 for macOS 12.6
	everRun 7.9.1
	Nutanix AHV (Version 2020.09.16 Community Edition)
	QEMU-KVM (Host OS: CentOS 8)
	  • Hypervisor: qemu-kvm-ev-6.2.0
	  • Hypervisor Services: libvirt-daemon-kvm-8.0.0
	  • Virtual Machine Manager: vmm v3.2.0

Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Note ▪ *The asterisk (*) symbol indicates that the version of the Visual Studio is supported and not tested in the current release.*

Linux 32-bit

The following table lists information about the Linux 32-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	i86_lsb
Package Identifier	i86_lsb
Tested Compiler	For x86: • gcc 11.2.1 (RHEL 9) • gcc 8.5.0 (RHEL 8.7)

Item	Description

Notes	• Customers can use any GCC that meets FlexNet Publisher's GLIBC version requirement.
	• FlexNet Publisher qualifies the default GCC version that comes with the OS.
	• `lmadmin` is supported using its 32-bit binary.
	• Multiple Ethernet hostids are supported.
	• Short-code transactions are supported.
	• Prepped Trusted Configuration is supported.
	• Tested virtual machine platforms include:
	VMware ESXi 7
	VMware Workstation 16.1.2
	Microsoft Windows Server 2019 Hyper-V
	Microsoft Windows 10 Hyper-V
	Citrix XenServer 8.2
	Oracle Virtual Box 6.1
	Parallels Desktop 18.0.2 for macOS 12.6
	everRun 7.9.1
	Nutanix AHV (Version 2020.09.16 Community Edition)
	QEMU-KVM (Host OS: CentOS 8)
	  • Hypervisor: qemu-kvm-ev-6.2.0
	  • Hypervisor Services: libvirt-daemon-kvm-8.0.0
	  • Virtual Machine Manager: vmm v3.2.0

Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Linux 64-bit

The following table lists information about the Linux 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	x64_lsb
Package Identifier	x64_lsb

Item	Description
Tested Compiler	For x64: • gcc 11.2.1 (RHEL 9) • gcc 8.5.0 (RHEL 8.7) • gcc 7.5.0 (SLES 15 SP3*) • gcc 7.5.0 (SLES 15 SP4) • gcc 9.4.0 (Ubuntu 20.04) • gcc 11.3.0 (Ubuntu 22.04)
Notes	• Customers can use any GCC that meets FlexNet Publisher's GLIBC version requirement. • `lmadmin` is supported using its 64-bit binary. • Multiple Ethernet hostids are supported. • Short-code transactions are supported. • Prepped Trusted Configuration is supported (x64_lsb only). • No dongle support on SLES 15 • Tested virtual machine platforms include: VMware ESXi 7 VMware Workstation 16.1.2 Microsoft Windows Server 2019 Hyper-V Microsoft Windows 10 Hyper-V Citrix XenServer 8.2 Oracle Virtual Box 6.1 Parallels Desktop 18.0.2 for macOS 12.6 everRun 7.9.1 Nutanix AHV (Version 2020.09.16 Community Edition) QEMU-KVM (Host OS: CentOS 8) ◦ Hypervisor: qemu-kvm-ev-6.2.0 ◦ Hypervisor Services: libvirt-daemon-kvm-8.0.0 ◦ Virtual Machine Manager: vmm v3.2.0
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Note ▪ *The asterisk (*) symbol indicates that the version of the operating system is supported and not tested in the current release.*

ARMv8-A (AArch64)

The following table lists information about the ARMv8-A (AArch64) systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	arm64_linux
Package Identifier	arm64_linux
Tested Compiler	• gcc 8.5.0 (RHEL 8.7) • gcc 7.3.1 (SLES 15)
Notes	• Customers can use any GCC that meets FlexNet Publisher's GLIBC version requirement. • `lmadmin` is not supported in this toolkit • No VM detection or VMID hostid support • No dongle support • No trusted storage support
Toolkit Functionality	Licensing based on license files.
Security Functionality	No support for tamper-resistant applications. The toolkit is labeled as *notr*.

macOS/OS X 64-bit

The following table lists information about the macOS/OS 64-bit system tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	• x64_mac
Package Identifier	• universal2_mac11

Item	Description
Tested Compiler	• Xcode 12.4 • Xcode 13.0 • Xcode 14.1 • Apple clang version 12.0.0 (clang-1200.0.32.28) • Apple clang version 11.0.0 (clang-1100.0.33.5) • Apple LLVM version 10.0.1 (clang-1001.0.46.4)
Notes	• Multiple Ethernet hostids are not supported. • Short-code transactions are supported. • Prepped Trusted Configuration is supported. • For building requirements, see Requirements for Building the macOS/OS X Licensing Toolkit.
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Requirements for Building the macOS/OS X Licensing Toolkit

When building the FlexNet Publisher Licensing Toolkit on macOS/OS X platforms, use an appropriate Apple development environment: The supplied makefiles build a universal Licensing Toolkit that can be used to produce FlexEnabled applications of the following types (all contained within a single FAT binary):

- For macOS 11.1, use Xcode 12.4
- For macOS 12.1, use Xcode 13.0
- For macOS 13.0.1 use Xcode 14.1

Required macOS/OS X SDKs

An SDK appropriate to the macOS/OS X version must be available on the machine where you are building the Licensing Toolkit:

- For macOS 11.1, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path.
- For macOS 12.1, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path
- For macOS 13.0.1, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path

macOS ARM 64-bit

The following table lists information about the macOS ARM64-bit system tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	• universal2_mac
Package Identifier	• universal2_mac11
Tested Compiler	• Xcode 13 • Apple clang version 13.0.0 (clang-1300.0.29.3)
Notes	• Prepped Trusted Configuration is supported. • For building requirements, see Requirements for Building the macOS/OS X Licensing Toolkit.
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications.

Requirements for Building the macOS ARM64 Licensing Toolkit

When building the FlexNet Publisher Licensing Toolkit on macOS ARM64 platform, use an appropriate Apple development environment:

- For macOS 11.7.2, use Xcode 13.0
- For macOS 12.6, use Xcode 12.5.1
- For macOS 13.2, use Xcode 14.3

Required macOS ARM64 SDKs

An SDK appropriate to the macOS ARM64 version must be available on the machine where you are building the Licensing Toolkit:

- For macOS 11.7.2, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path.
- For macOS 12.6, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path.
- For macOS 13.2, use **`xcode-select --print-path`** to obtain the correct path and choose an appropriate SDK path.

Solaris 32-bit

The following table lists information about the Solaris 32-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	• x86_sol (on x86) • sun4_u (on SPARC 32-bit)
Package Identifier	• x86_sol10 (on x86) • sun4_u10 (on SPARC 32-bit)
Tested Compiler	For x86: • cc (Sun C) 5.11 • cc (Sun C) 5.15 For SPARC 32-bit: • cc (Sun C) 5.14 • cc (Sun C) 5.15
Notes	• `lmadmin` is supported in this toolkit. • Synchronous I/O multiplexing, via select, is supported for up to 65,535 file descriptors. • The number of system semaphore arrays can become exhausted. • Shared objects might not run when compiled with gcc on SPARC 32-bit. • Multiple Ethernet hostids are not supported. • Prepped Trusted Configuration is supported.
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

Solaris 64-bit

The following table lists information about the Solaris 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	• x64_sun (on x64) • sun64_u (on SPARC 64-bit)
Package Identifier	• x64_sun10 (on x64) • sun64_u10 (on SPARC 64-bit)
Tested Compiler	For x64: • cc (Sun C) 5.11 • cc (Sun C) 5.15 For SPARC 64-bit: • cc (Sun C) 5.14 • cc (Sun C) 5.15
Notes	• `lmadmin` is supported using its 64-bit binary. While the 32-bit `lmadmin` binary (contained in the x86_sun and sun64_u toolkits) continues to be supported on 64-bit systems, Revenera recommends using the 64-bit binary on 64-bit systems. • Shared objects might not run when compiled with gcc on SPARC 64-bit. • Multiple Ethernet hostids are not supported. • Prepped Trusted Configuration is supported.
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

AIX 32-bit

The following table lists information about the AIX 32-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	ppc_u
Package Identifier	ppc_u5 (on PowerPC™)

Item	Description
Tested Compiler	PowerPC cc (IBM XLC): 11.1 (AIX 7.1) and 13.1.3 (AIX 7.2)
Notes	• `lmadmin` is supported in this toolkit. • The AIX FlexNet Publisher client libraries are PIC by default; therefore, only one version of these libraries is provided in the toolkit. • Java SDK is not supported.
Toolkit Functionality	Licensing based on license files.
Security Functionality	No support for tamper-resistant applications. The toolkit is labeled as *notr*.

AIX 64-bit

The following table lists information about the AIX 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	rs64_u
Package Identifier	rs64_u5 (on PowerPC™)
Tested Compiler	PowerPC cc (IBM XLC): 11.1 (AIX 7.1) and 13.1.3 (AIX 7.2)
Notes	• `lmadmin` is supported using its 64-bit binary. While the 32-bit `lmadmin` binary (contained in the ppc_u toolkit) continues to be supported on 64-bit systems, Revenera recommends using the 64-bit binary on 64-bit systems. • You must use ar -X64 and strip -X64 on this platform. • The AIX FlexNet Publisher client libraries are PIC by default; therefore only one version of these libraries is provided in the toolkit. • Java SDK is not supported.
Toolkit Functionality	Licensing based on license files.
Security Functionality	No support for tamper-resistant applications. The toolkit is labeled as *notr*.

Java Standard Edition

The following table lists information about the Java Standard Edition systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	java
Package Identifier	Not applicable
Tested Compiler	• JDK 11 (JDK 11 is not supported on Solaris x86 and x64) • JDK 17 (JDK 17 is not supported on Solaris x86 and x64) • OpenJDK 17 (in macOS `lmadmin` installer will not work as mentioned in FNP-24247)
Notes	• Implements the FlexNet Licensing for Java client library only. • Requires a C development environment. • Requires tamper-resistant licenses (TRL) to be enabled.
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	No support for tamper-resistant applications. The toolkit is labeled as *notr*.

HP-UX 64-bit

The following table lists information about the HP-UX 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

Item	Description
Platform Name	it64_hp (on Intel Itanium)
Package Identifier	it64_hp11i (on Intel Itanium)
Tested Compiler	Intel Itanium HP C/aC++ B3910B A.06.12

Item	Description

Notes	• `lmadmin` has not been tested in this toolkit.
	• On Intel Itanium, use the `lmhostid` utility to determine the hostid. This returns the machine identification and is equivalent to the identification returned by the HP_UX command `getconf CS_PARTITION_IDENT`. For example:
	`>lmhostid`
	`>The FlexNet Licensing host ID of this machine is “ID_STRING=9c788319-db72-d411-af62-0060b05e4c05”`
	Older methods of obtaining the hostid that return the Ethernet address are still supported, but may fail on some systems. The older methods include:
	`>uname -i (returns decimal hostid)`
	`>lmhostid -long (returns hexidecimal hostid)`
	• Multi-threaded licensing libraries are available on Intel Itanium.

Toolkit Functionality	Licensing based on license files.

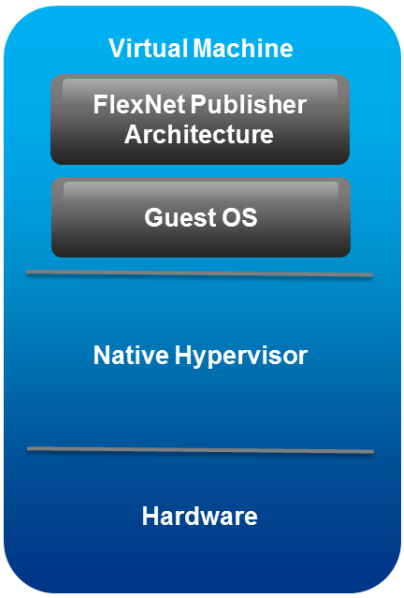
Toolkits That Support Prepped Trusted Configuration

Toolkit platforms that support prepped Trusted Configuration (and therefore server-side local trial ASRs) include the following:

- i86_lsb (32-bit Linux)
- x64_lsb (64-bit Linux)
- i86_n3 (32-bit Windows)
- x64_n6 (64-bit Windows)
- sun4_u10 (32-bit Solaris SPARC)
- sun64_u10 (64-bit Solaris SPARC)
- x86_sol10 (32-bit Solaris Intel)
- x64_sun10 (64-bit Solaris Intel)
- x64_mac10 (Universal macOS)
- universal2_mac11 (Universal macOS)

Virtualization

The following picture illustrates how the FlexNet licensing server or a FlexEnabled application operates within a Virtualization stack. The table below the picture lists the Virtualization stacks that have been tested with FlexNet Publisher.



Use the following table to determine the tested Virtualization stacks.

Table 3 ▪ Tested Virtualization Stacks

FlexNet Publisher Architecture	Guest OS	Hypervisor
i86_n, x64_n	Windows 10	VMware ESXi 7
		Citrix XenServer 8.2
		VMware Workstation 16.1.2
		Oracle Virtual Box 6.1
		QEMU-KVM
		PARALLELS
		everRun 7.9.1

Table 3 ▪ Tested Virtualization Stacks

FlexNet Publisher Architecture	Guest OS	Hypervisor
i86_n, x64_n	Windows Server 2019 Windows 10	VMware ESXi 7 Citrix XenServer 8.2 QEMU-KVM PARALLELS everRun 7.9.1
	Windows Server 2022	VMware QEMU-KVM everRun 7.9.1 Microsoft Hyper-V from Windows Server 2022 Microsoft Hyper-V from Windows 10 Enterprise
i86_lsb	RHEL 7, 8, and 9	VMware ESXi 7 VMware Workstation 16.1.2 Citrix XenServer 8.2 PARALLELS Microsoft Hyper-V from Windows 10 Enterprise Oracle Virtual Box 6.1 QEMU-KVM everRun 7.9.1
x64 _lsb	RHEL 7, 8, and 9 SLES 12 SP4, SLES 15 SP1, SLES 15 SP2, SLES 15 SP3 and SLES 15 SP4	VMware ESXi 7 VMware Workstation 16.1.2 Citrix XenServer 8.2 PARALLELS Microsoft Hyper-V from Windows Server 2022 Oracle Virtual Box 6.1 QEMU-KVM everRun 7.9.1
x64_n6	Windows10	Nutanix AHV (Version 2020.09.16 Community Edition)
x64_lsb, i86_lsb	RHEL8.7 and SUSE15SP4	Nutanix AHV (Version 2020.09.16 Community Edition)

Note ▪ *Note the following:*

- *Supported hostids in guest operating systems are `ETHER` (server and client) and, for all hypervisors other than Hyper-V, `VM_UUID` (server only). See the white paper, "Understanding Virtualization Features in FlexNet Publisher", for more information.*
- *It is a best practice to run license servers on a server-based OS.*
- *For Windows and Linux certificate applications, the FlexNet Licensing Service needs to be installed for VM_UUID hostid to be extracted.*
- *The asterisk (*) symbol indicates that the version of the operating system is supported and not tested in the current release.*

Tested Cloud Environments

Use the following table to determine guest operating systems and hostids that have been tested with FlexNet Publisher in the specified cloud environment.

Table 4 ▪ Tested Cloud Environments

FlexNet Publisher Architecture	Tested OS	Cloud Platform	Host ID

i86_n, x64_n	• Windows 10
	• Windows Server 2019
		Google Cloud
		Microsoft Azure
			License servers:
			`VM_UUID`
			FlexEnabled clients:
			`ETHER`

i86_n, x64_n	• Windows Server 2019
	• Windows Server 2022
		Amazon EC2	License servers:
			`VM UUID` (previously `AMZN_IID`)
			`AMZN_EIP`
			FlexEnabled clients:
			`AMZN_IID`
			`ETHER`

i86_lsb, x64_lsb	• RHEL 7* and RHEL 8
	• SLES 15 SP2
		Google Cloud	License servers:
			`VM_UUID`
			FlexEnabled clients:
			`AMZN_IID`
			`ETHER`

Table 4 ▪ Tested Cloud Environments

FlexNet Publisher Architecture	Tested OS	Cloud Platform	Host ID

i86_lsb, x64_lsb	• RHEL 8
	• SUSE 15 SP3
		Microsoft Azure	License servers:
			`VM_UUID`
			FlexEnabled clients:
			`AMZN_IID`
			`ETHER`

i86_lsb, x64_lsb	• RHEL 7* and 8
	• SUSE 15 SP3
		Amazon EC2	License servers:
			`AMZN_EIP` or `VM_UUID`
			FlexEnabled clients:
			`AMZN_IID`
			`ETHER`

Note ▪ *Take note of the following:*

- *Google Cloud, Amazon EC2 and Microsoft Azure can all use VM_UUID. VM_UUID is equivalent to AMZN_IID on EC2, Google Instance ID on Google and SMBIOS UUID on Azure*
- *AMZN_IID is superseded by VM_UUID for server-line hostid, but unlike VM_UUID is supported for feature-line hostid.*
- *For Windows and Linux certificate applications, the FlexNet Licensing Service needs to be installed for cloud hostids (VM_UUID, AMZN_EIP, AMZN_IID) to be extracted.*

System Requirements for lmadmin

The following sections describe tested platforms and requirements for `lmadmin`:

- Tested Platforms
- Additional System Requirements
- Tested Browsers

Note ▪ *`lmadmin` installers are no longer packaged within FlexNet Publisher kit archives, and must be downloaded separately.*

Tested Platforms

`lmadmin` has been tested on the following platforms.

Table 5 ▪ Tested `lmadmin` Platforms

Platform Architecture	Processor Type	Operating System
AIX 32-bit	PowerPC	AIX 7.1 and 7.2
AIX 64-bit	PowerPC	AIX 7.1 and 7.2
Linux 32-bit	x64	RHEL 8 and 9
Linux 64-bit	x64	RHEL 8 and 9 SLES 15 SP3 and SLES 15 SP4 Ubuntu 20.4
macOS/OS X 64-bit	x64	macOS 11.1 macOS 12.1
macOS ARM 64-bit	ARM-64	macOS 11.7.2 macOS 12.1
Microsoft Windows 32-bit	x64	Windows Server 2019 Windows Server 2022
Microsoft Windows 64-bit	x64	Windows 10 Windows 11 Windows Server 2019 Windows Server 2022 It is a best practice to run license servers on a server-based OS.
Solaris 32-bit	SPARC 32-bit x86	Solaris 10 and 11
Solaris 64-bit	SPARC 64-bit x86-x64	Solaris 10 and 11

Note ▪ *Take note of the following:*

- *The FlexNet Publisher Licensing Toolkits for 64-bit platforms supply 64-bit `lmadmin` binaries. Revenera recommends their use on 64-bit platforms. Separate 32-bit `lmadmin` installers and binary archives are also available and can be used on 64-bit platforms if necessary.*
- *The asterisk (*) symbol indicates that the version of the operating system is supported and not tested in the current release.*

Additional System Requirements

`lmadmin` has these additional requirements:

- To use `lmadmin` on Windows platforms, the relevant Microsoft Visual C++ 2013 Redistributable Package must be installed.
- The `lmadmin` installer requires that JRE 1.6 or later (for macOS/OS X: JRE 1.7 or later) is installed. If the JRE is not already present on the machine, it must be installed separately, because it is not bundled with the `lmadmin` installer.

Tested Browsers

`lmadmin` is tested on the following Web browsers:

- **Red Hat Linux**—Mozilla Firefox 46.x, Google Chrome 106.x
- **Windows**—Microsoft Edge
- **macOS/OS X**—Apple Safari 6.x and 11

Deprecated Features and Commands

The following table lists deprecated features and commands.

Table 6 ▪ Deprecated Features and Commands

Deprecated Features and Commands	Comments
Console mode on `lmadmin` installation on macOS/OS X	On macOS/OS X, the `lmadmin` installer no longer supports Console mode.
Non-multithreaded libraries	The following UNIX client libraries used with applications that do not use native multithreaded libraries have been deprecated: • `liblmgr_nomt_pic.a` • `liblmgr_nomt_pic_trl.a` • `liblmgr_nomt.a` • `liblmgr_nomt_trl.a`

Table 6 ▪ Deprecated Features and Commands

Deprecated Features and Commands	Comments
License Generator toolkit	License Generator toolkit is end-of-life. Instead, the responsegen shared object API has been exposed; see the example `.\examples\activation\responsegen\ResponseGenApi.c`.
AMZN_IID, HPV_UUID, VMW_UUID	Replaced by VM_UUID
lmbind & LMB_* hostids	lmbind is no longer packaged with FlexNet Publisher archives. lmbind sections have been removed from documentation
VMW_* and HPV_* hostids	It is better to have a hostid that is effective in both physical and virtual systems. As an example, we would recommend ETHER instead of VMW_ETHER (on VMware guests) or HPV_ETHER (on Hyper-V guests)
Non trial-id trial ASRs	ASRs which do not use a trial-id are subject to an issue where deleting trusted storage means no further (non trial-id) ASRs can be loaded. Trial-id ASRs were invented to solve this issue.
License keys and default strength signatures	License keys have been documented as obsolete for several years. Signatures of type LM_STRENGTH_LICENSE_KEY and LM_STRENGTH_LICENSE_DEFAULT are easily cracked. Revenera strongly recommends that new license files use TRL-strength signatures and that updated clients link with the 'trl-only' (lmgr_trl.lib) library.
Decimal licenses and lc_convert API	Decimal licenses are deprecated. Consequently sections on decimal licenses and the **lc_convert** API have been removed from documentation.
Trusted Storage on AIX	Trusted storage is no longer supported on AIX.
Three-Server Redundancy	Three-server redundancy is supported with license file–based licensing only. It is not supported with trusted storage–based licensing.

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