FlexNet Publisher 2020 (11.16.6) Release Notes

January 2020
Revision 00

Enhancements

Bulk Custom Dup Group Checkout

A new attribute, LM_A_MULTIPLE_CHECKOUT_DATA allows multiple custom DUP_GROUP checkout.

Previously, if one wanted to perform 2 checkouts from a client using custom dup grouping, one would have had to perform two separate checkouts, like this

```
lc_set_attr(job1, LM_A_CHECKOUT_DATA, "abc" ); // checkout data for first custom dup-group
checkout
lc_checkout(job1, "f1", "1.0", 1, LM_CO_NOWAIT, &code, LM_DUP_VENDOR);
lc_set_attr(job1, LM_A_CHECKOUT_DATA, "cde" ); //  checkout data for second custom dup-group
checkout
lc_checkout(job1, "f1", "1.0", 1, LM_CO_NOWAIT, &code, LM_DUP_VENDOR);
```

Now, one can checkout both licenses from a single checkout call

```
lc_set_attr(job1, LM_A_MULTIPLE_CHECKOUT_DATA, "abc" "\f" "cde"); /* Use "\f" as the delimiter
between discrete checkout data strings */
lc_checkout(job1, "f1", "1.0", 1, LM_CO_NOWAIT, &code, LM_DUP_VENDOR);
```

The maximum number of discrete checkout data strings allowed when setting LM_A_MULTIPLE_CHECKOUT_DATA is 100, and the total length of the string supplied (including delimiters) must not exceed 1024 bytes.

The LM_A_MULTIPLE_CHECKOUT_DATA attribute is intended to improve license server performance with clients that perform large numbers of custom dup group checkouts, by reducing protocol chattiness.

Limitation: LM_A_MULTIPLE_CHECKOUT_DATA is not supported from Java kit.

(FNP-21764)

Security Updates

Third Party Library Updates

OpenSSL Upgrade

OpenSSL has been upgraded to 1.1.0k.

(FNP-21602)

Apache Upgrade

Apache version has been upgraded to 2.4.41.

(FNP-21605)

Expat Upgrade

Expat used by lmadmin has been upgraded to 2.2.8.

(FNP-21722)

Sentinel LDK Upgrade

Sentinel LDK has been upgraded to V7.101.

(FNP-21851 - CVE-2019-0925)

NCSD Document Updates

NCSD Document Split into Two Sets of Documents

FNP has published single set NCSD (Non-Commercial Software Disclosures) documents related to non commercial software (NCS), used for both FNP and lmadmin, in previous releases. From this release, two sets of NCSD documents will be published:

1. Publishers who are using FNP **without** lmadmin should to refer to the following NCSD documents. These NCSD documents contain information on NCS used only for FNP:-
    a. FNP-Licensing-11.16.6-NCSD Summary.pdf
    b. FNP-Licensing-11.16.6-NCSD License Texts.pdf
2. Publishers who are using FNP **with** lmadmin should to refer to the following NCSD documents. These NCSD documents contain information on full set of NCS used for FNP with lmadmin:-
    a. FNP-Licensing-11.16.6-lmadmin-NCSD Summary.pdf
    b. FNP-Licensing-11.16.6-lmadmin-NCSD License Texts.pdf

(FNP-21948)

Dongle Updates

Gemalto Dongle Driver Update

FLEXID9 (Gemalto) has been updated to version 7.10 on Windows, Linux and MacOS/OS X.

The shared libraries on all these platforms have been updated to version 7.10.

(FNP-21750)

Platform Updates

11.16.6 Updates

MacOS

Support for MacOS/OS X 10.15

In this release, FlexNet Publisher kit supports MacOS/OS X 10.15.

Integrated Products and Tested Versions

Product	Tested Version
FlexNet Operations	FlexNet Operations 2018 R1 (18.1.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2019 R2 (15.10.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2019 R2 (19.2.0)

11.16.5.1 Updates

There are no platform updates to report for FlexNet Publisher 11.16.5.1.

11.16.5 Updates

Integrated Products and Tested Versions

Product	Tested Version
FlexNet Operations	FlexNet Operations 2018 R1 (18.1.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2019 R1 (15.9.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2019 R1 (19.1.1)

11.16.4 Updates

Linux

Support for RHEL 8

In this release, FlexNet Publisher kit supports RHEL 8.

Integrated Products and Tested Versions

Product	Tested Version
FlexNet Operations	FlexNet Operations 2018 R1 (18.1.0)
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2019 R1 (15.9.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2019 R1 SP1(19.1.1)

Resolved Issues

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

Resolved lmadmin, lmgrd, and Utility Issue

lmadmin GUI displays expected information

Concurrent tab in lmadmin GUI no longer displays the error “Vendor error: vendorName”, when number of connections exceeds by the limit set with option file keyword MAX_CONNECTIONS value. It is showing the expected information on the GUI page.

(FNP-20665)

Lmreread parity with lmgrd and lmadmin

lmadmin and lmgrd were behaving differently when a maximum connection limit is reached. Earlier, when the MAX_CONNECTIONS option file keyword is set, the lmreread utility connects and successfully performs a re-read with lmgrd, but not with lmadmin. It is resolved now, lmreread behaves consistantly with lmgrd and lmadmin after reaching the maximum connection limit.

(FNP-20711)

Resolved lmremove Utility Issue

With lmremove utility, components of same package cannot be removed from server, if already one component is removed and these components are checked out on common socket connection. The issue is seen when PACKAGE line contains the keyword OPTIONS=SUITE.

With latest fix on server side, lmremove utility will again work as previously. All the components, checked out on same socket connection, will be removed altogether while removing any one of the component with lmremove.

(FNP-21115)

Resolved File Info Issue

In windows environment, tsactdiags utility was not able to display version information. The utility now contains RC file (resource file) and it provides required information about File Description, File Version, Product name, Product version, Copyright and Original filename in tsactdiags.

(FNP-21497)

Resolved Memcpy Memory Overlap Issue

Resolved the memory overlap issue in memcpy for LM_OLDVER error scenarios.

(FNP-21499)

Resolved lmadmin Remote Shutdown Issue

lmadmin was vulnerable to stack exhaustion due to a recursive function call in the server. This is now fixed.

(FNP-21596)

Resolved lmadmin Absolute Path Issue

Relative path support for the log file path is re-instated in lmadmin.

(FNP-21889)

Resolved Issue between Client and License Server

Resolved LM_NOSERVSUPP Error Issue

In 11.16.6, clients that depend on LM_NOSERVSUPP being returned for the below error conditions, a vendor variable, ls_prefer_noservsupp can now be set in lsvendor.c file.

If set to 1 (default value 0) the license server will return the prior error code LM_NOSERVSUPP in all the below scenarios.

- Feature not served: -5 (LM_NOFEATURE)
- Feature expired: -10 (LM_LONGGONE)
- Feature start date in future: -31 (LM_TOOEARLY)

(FNP-21844)

Resolved Issue Specific to Trusted Storage-Based Licensing

UMN1 Value Issue

The UMN1 value could not be retrieved when the machine contained an NVMe SSD drive with RAID as a bus type. This is now resolved and UMN1 value can be retrieved.

(FNP-21822)

Known Issues

Known Dongle Issues

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)

Known lmadmin Issues

On Non-Windows Platforms, Importing a Previous Installation Fails to Copy the Old Logs Folder

In lmadmin, a warning “Error importing from previous installation” followed by “Couldn’t copy log file” is observed. This behavior is observed on Non-Windows platforms when one chooses to import from previous installation.

As a workaround, users are advised to copy logs from their old location manually.

(FNP-22245)

Lmadmin Silent Installer not Displaying Required Error Message

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

(FNP-6942)

Error when Installing lmadmin as a Service on Windows with Multibyte Characters in the Install Path

`lmadmin` may not run correctly if installed as a service to a path with multibyte characters.

(FNP-11879; Salesforce case 00830014)

Error when Running lmadmin on Suse Linux 11 Sp4

An error will occur when trying to run `lmadmin` on SuSE Linux 11 SP4, because the OpenLDAP shared libraries packaged with `lmadmin` are not suitable for this platform.

To run `lmadmin` on SuSE Linux 11 SP4, remove the files `libldap*` and `liblber*` that are located in the same directory as the `lmadmin` executable, or move these files to a different directory. The `lmadmin` executable will then use the system-supplied versions of these libraries.

(FNP-19151)

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)

lmreread Limitations

When a single job checks out multiple licenses of different features/pools, post re-read if one or more of the supported features are dropped, then all the existing checkouts will go through the process of reconnection. If any jobs are queued for the same features, they may consume the released licenses.

After re-read, when a single license pool cannot serve all the licenses to a reconnecting client (partial checked out license is upgraded before the re-read), the client will exit unless it is a bulk checkout scenario.

(FNP-19625)

"MAX_CONNECTIONS" Option File Keyword

MAX_CONNECTIONS warnings may be observed while features get checked in from a Linux client.

(FNP-20617)

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)

lmstat Limitations

The limitations of lmstat with “--no-user-info” option are as follows.

1. Only the number of users queued for a feature can be reported using this solution and not the total number of licenses queued for a feature.

2. License pools with effectively zero number of licenses issued, (which, for example, arises in the case of an INCREMENT line followed by a corresponding UPGRADE line), will be skipped in the lmstat output given for the “-a --no-user-info” combination (as is the case with just the “-a” option). The idea of license pools with effectively zero licenses issued is only with respect to the internal implementation of license pools, and as such, this concept is ignored by lmstat.

3. Running lmstat with “-a --no-user-info” against an uncounted license file will not be supported. If an uncounted license file is among the license files served by a license server, that uncounted license file will be ignored.

4. Running lmstat with “-a --no-user-info” will not provide information about served features having an uncounted number of licenses.

5. The execution of lmstat with “-a --no-user-info” will not print the details of expired features or features with future start date.

6. The current implementation of “--no-user-info” does not support the usage of multiple license servers (e.g.: “port1@host1:port2@host2”) in the license path specified using “-c” option.

7. Details of features that come from Trusted Storage will not be available using this option.

8. The current implementation of “--no-user-info” may result in an individual feature detail being displayed more than once when a single license server is started with multiple vendor daemons.

9. When a PACKAGE line is used with the OPTIONS=SUITE_RESERVED keyword, and “n” licenses of just one of the components (features) defined in the COMPONENTS property are checked out, the “--no-user-info” option will result in displaying all the package components with reservation count as “n” and with zero floating non-reserved licenses in use (even for the component that was requested to be checked out).

(FNP-19642)

Known Issues Specific to Trusted Storage–Based Licensing

Borrow Activation to a Linux Client Causes a Crash

The **flxActBorrowActivate** function crashes when server trusted storage contains an INCREMENT line before a PACKAGE line. However, FlexNet Operations does not produce licenses in this configuration.

(FNP-10437; Salesforce case 00506917)

Known Java Issues

Limitation of Queuing in Java Clients

When a Java client is set to queueing with the Synch_queue option, the clients get queued even when there are no licenses available while it waits for `SOCKET_READ_TIMEOUT` for 20 seconds. The licenses get dequeued when there is no response from the server, then exits throwing `LM_CANTRECEIVE FlexlmException`.

(FNP-11414; Salesforce cases 00753089, 01026773)

System Requirements

Tested Platforms

The following sections describe the platforms tested with the FlexNet Publisher 2020 (11.16.6) 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:
http://www.flexerasoftware.com/support/additional-support/end-of-life/flexnet-publisher.html

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	x86	RHEL 6 and 7
Linux 32-bit	x64	RHEL 8 RHEL 7 SLES 11 SP4
Linux 64-bit	x64	RHEL 6, 7 and 8 SLES 11 SP4, SLES 12 SP4, SLES 15, and SUSE 15 SP1 Ubuntu 16.04, 18.04, and 18.10
Linux 64-bit	ARMv8-A (AArch64)	RHEL 7 and 8 SLES 15
macOS/OS X 64-bit	x64	MacOS 10.15 MacOS 10.14
Microsoft Windows 32-bit	x86	Windows 10 Windows 7 SP1 It is a best practice to run license servers on a server-based OS.
Microsoft Windows 32-bit	x64	Windows Server 2019 Windows Server 2016

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

Platform Type	Hardware Type	Operating System
Microsoft Windows 64-bit	x64	Windows 10 Windows 8.1 Windows 7 SP1 Windows Server 2019 Windows Server 2016 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

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 x86 • Solaris x64	Java Standard Edition 1.8
	• Solaris SPARC 32-bit • Solaris SPARC 64-bit • Windows x86 • Windows x64 • Linux x86 • Linux x64 • macOS x64	Java Standard Edition 1.8 and 1.11

Detailed Platform Information

The following sections list the operating systems and their associated hardware platforms tested with FlexNet Publisher 2020 (11.16.6). 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 Flexera'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
  - Linux 32-bit
  - ARMv8-A (AArch64)
  - Solaris 32-bit
  - AIX 32-bit
  - Java Standard Edition
  - Microsoft Windows 64-bit
  - Linux 64-bit
  - macOS/OS X 64-bit
  - Solaris 64-bit
  - AIX 64-bit
  - 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:

Platform Name	i86_n
Package Identifier	i86_n3
Tested Compiler	• Visual Studio 2019 (16.2.5) • Visual Studio 2017 (15.9.13) • Visual Studio 2015 Update 3 • Visual Studio 2013 Update 5

Notes	• `lmadmin` is supported in this toolkit.
	• Multiple Ethernet hostids are supported.
	• Short-code transactions are supported.
	• Prepped Trusted Configuration is supported.
	• Tested virtual machine platforms include:
	VMware Workstation 15.1.0
	VMware ESXi 6.5 and 6.7
	Microsoft Windows Server 2016 Hyper-V
	Microsoft Windows Server 2019 Hyper-V
	Microsoft Windows 10 Hyper-V
	Citrix XenServer 8.0
	Oracle Virtual Box 5.2.18
	QEMU-KVM (Host OS: CentOS 7.5)
	  • Hypervisor: qemu-kvm-ev-2.10.0
	  • Hypervisor Services: libvirt-daemon-kvm-3.9.0-14
	  • Virtual Machine Manager: vmm v1.4.3

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

Microsoft Windows 64-bit

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

Platform Name	x64_n
Package Identifier	x64_n6
Tested Compiler	• Visual Studio 2019 (16.2.5) • Visual Studio 2017 (15.9.13) • 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, Flexera 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 15.1.0
	VMware ESXi 6.5 and 6.7
	Microsoft Windows Server 2016 Hyper-V
	Microsoft Windows Server 2019 Hyper-V
	Microsoft Windows 10 Hyper-V
	Citrix XenServer 8.0
	Oracle Virtual Box 5.2.18
	QEMU-KVM (Host OS: CentOS 7.5)
	  • Hypervisor: qemu-kvm-ev-2.10.0
	  • Hypervisor Services: libvirt-daemon-kvm-3.9.0-14
	  • Virtual Machine Manager: vmm v1.4.3

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

Linux 32-bit

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

Platform Name	i86_lsb
Package Identifier	i86_lsb

Tested Compiler	For x86: • gcc 8.2.1 (RHEL 8) • gcc 4.8.5 (RHEL 7) • gcc 4.4.7 (RHEL 6) • gcc 4.3.4 (SLES 11 SP4)
Notes	• `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 6.5 and 6.7 VMware Workstation 15.1.0 Microsoft Windows Server 2016 Hyper-V Microsoft Windows Server 2019 Hyper-V Microsoft Windows 10 Hyper-V Citrix XenServer 8.0 Oracle Virtual Box 5.2.18 QEMU-KVM (Host OS: CentOS 7.5) ◦ Hypervisor: qemu-kvm-ev-2.10.0 ◦ Hypervisor Services: libvirt-daemon-kvm-3.9.0-14 ◦ Virtual Machine Manager: vmm v1.4.3
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:

Platform Name	x64_lsb
Package Identifier	x64_lsb

Tested Compiler	For x64: ● gcc 4.8.5 (RHEL 7) ● gcc 4.4.7 (RHEL 6) ● gcc 8.2.1 (RHEL 8.0) ● gcc 7.3.1 (SLES 15) ● gcc 4.8.5 (SLES 12 SP4) ● gcc 4.3.4 (SLES 11 SP4) ● gcc 7.3.0 (Ubuntu 18.04) ● gcc 5.4.0 (Ubuntu 16.04)
Notes	● `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 6.5 and 6.7 VMware Workstation 15.1.0 Microsoft Windows Server 2016 Hyper-V Microsoft Windows Server 2019 Hyper-V Microsoft Windows 10 Hyper-V Citrix XenServer 8.0 Oracle Virtual Box 5.2.18 QEMU-KVM (Host OS: CentOS 7.5) ● Hypervisor: qemu-kvm-ev-2.10.0 ● Hypervisor Services: libvirt-daemon-kvm-3.9.0-14 ● Virtual Machine Manager: vmm v1.4.3
Toolkit Functionality	Licensing based on license files or trusted storage.
Security Functionality	Support for tamper-resistant applications. The toolkit is labeled as *standard*.

ARMv8-A (AArch64)

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

Platform Name	arm64_linux
Package Identifier	arm64_linux
Tested Compiler	• gcc 8.2.1 (RHEL 8) • gcc 7.3.1 (SLES 15)
Notes	• `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:

Platform Name	• x64_mac
Package Identifier	• universal_mac10_applelibcpp • x64_mac10
Tested Compiler	• Xcode 11.0 • Xcode 10.3 • Apple clang version 11.0.0 (clang-1100.0.33.5) • Apple LLVM version 10.0.1 (clang-1001.0.46.4)

Notes	• The universal toolkit contains both the x86 and x64 `lmadmin` binaries and their installers. An x64-only `lmadmin` installer and archive are available separately. • lmadmin and its installer will not be shipped along with x64_mac10 toolkit. • 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:

- For macOS 10.15, use Xcode 11.0
- For macOS 10.14, use Xcode 10.3

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):

- 64-bit Intel—Runs on OS X 10.14 Intel 64-bit platforms

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 10.15, use **`xcode-select --print-path`** to obtain the correct path and choose 10.15 SDK path
- For macOS 10.14, use **`xcode-select --print-path`** to obtain the correct path and choose 10.14 SDK path

Solaris 32-bit

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

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:

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, Flexera 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:

Platform Name	ppc_u
Package Identifier	ppc_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 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:

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, Flexera 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:

Platform Name	java
Package Identifier	Not applicable
Tested Compiler	• JDK 8 • JDK 11 (JDK 11 is not supported on Solaris x86 and x64) • OpenJDK 12 (Open JDK 12 is not supported to use lmadmin Installer on Windows Server 2019)
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:

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
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.

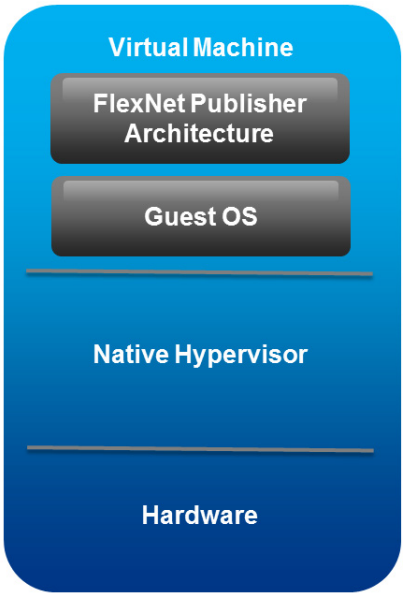
Toolkits That Support Prepped Trusted Configuration

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

- i86_lsb (32-bit Linux)
- i86_n3 (32-bit Windows)
- sun4_u10 (32-bit Solaris SPARC)
- x86_sol10 (32-bit Solaris Intel)
- universal_mac10 (Universal Mac)
- x64_lsb (64-bit Linux)
- x64_n6 (64-bit Windows)
- sun64_u10 (64-bit Solaris SPARC)
- x64_sun10 (64-bit Solaris Intel)
- x64_mac10 (Universal Mac)

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 7 SP1	VMware ESXi 6.5 and 6.7
		Citrix XenServer 8.0
		VMware Workstation 15.1.0
		Oracle VirtualBox 5.2.18
		QEMU-KVM
	Windows 10	VMware ESXi 6.5 and 6.7
		Citrix XenServer 8.0
		VMware Workstation 15.1.0
		Oracle VirtualBox 5.2.18
		QEMU_KVM

Table 3 • Tested Virtualization Stacks

FlexNet Publisher Architecture	Guest OS	Hypervisor
i86_n, x64_n	Windows 10	Microsoft Hyper-V from Windows Server 2016
	Windows 7 SP1	Microsoft Hyper-V from Windows Server 2019
	Windows Server 2019	Microsoft Hyper-V from Windows 10 Pro
	Windows Server 2016	VMware ESXi 6.5 and 6.7
	Windows Server 2019	Citrix XenServer 8.0
		QEMU-KVM
i86_lsb	RHEL 6 and 7	VMware ESXi 6.5 and 6.7
	SLES 11 SP4	VMware Workstation 15.1.0
		Citrix XenServer 8.0
		QEMU-KVM
		Microsoft Hyper-V from Windows Server 2016
		Microsoft Hyper-V from Windows Server 2019
		Microsoft Hyper-V from Windows 10 Pro
		Oracle VirtualBox 5.2.18
x64 _lsb	RHEL 6 and 7	VMware ESXi 6.5 and 6.7
	SLES 11 SP4, SLES 12 SP4, and SLES 15	VMware Workstation 15.1.0
		Citrix XenServer 8.0
		QEMU-KVM
		Microsoft Hyper-V from Windows Server 2016
		Microsoft Hyper-V from Windows 10 Pro
		Oracle VirtualBox 5.2.18

Note •

- *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.*

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 Server 2016 • Windows 10	Google Cloud Microsoft Azure	License servers: VM_UUID FlexEnabled clients: ETHER
i86_n, x64_n	• Windows Server 2016 • Windows 10	Amazon EC2	License servers: VM_UUID (previously AMZN_IID) AMZN_EIP FlexEnabled clients: AMZN_IID ETHER
i86_lsb, x64_lsb	• RHEL 6 and 7 • SLES 11 SP4	Google Cloud Microsoft Azure	License servers: VM_UUID FlexEnabled clients: AMZN_IID ETHER
i86_lsb, x64_lsb	• RHEL 6, 7 and 8 • SLES 11 SP4 and SUSE 15	Amazon EC2	License servers: AMZN_EIP or VM_UUID FlexEnabled clients: AMZN_IID ETHER

Note •

- *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	x86	RHEL 6
Linux 32-bit	x64	RHEL 7 SLES 11 SP4
Linux 64-bit	x64	RHEL 6, 7 and 8 SLES 11 SP4, SLES 12 SP4, and SLES 15 Ubuntu 16.04, 18.04, and 18.10
macOS/OS X 64-bit	x64	MacOS 10.15 MacOS 10.14
Microsoft Windows 32-bit	x86	Windows 10 Windows 8.1 Windows 7 SP1 It is a best practice to run license servers on a server-based OS.
Microsoft Windows 32-bit	x64	Windows Server 2019 Windows Server 2016

Table 5 • Tested `lmadmin` Platforms

Platform Architecture	Processor Type	Operating System
Microsoft Windows 64-bit	x64	Windows 10 Windows 8.1 Windows 7 SP1 Windows Server 2019 Windows Server 2016 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 • *The FlexNet Publisher Licensing Toolkits for 64-bit platforms supply 64-bit lmadmin binaries. Flexera 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.*

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 61.x
- Windows—Microsoft Internet Explorer 11, Microsoft Edge
- macOS/OS X—Apple Safari 6.x and 11

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`
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. Flexera strongly recommends that new license files use TRL-strength signatures and that updated clients link with the 'trl-only' (lmgr_trl.lib) library.

Table 6 • Deprecated Features and Commands

Deprecated Features and Commands	Comments
CVD (Common Vendor Daemon)	Other than for producers who have legacy licensing applications using CVD, this feature is no longer supported. Consequently CVD sections have been removed from documentation.
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.

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