



# FlexNet Publisher 2017 (11.15.0) Release Notes

November 2017  
Revision 03

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# New Features

## New TPM hostid

FlexNet Publisher now supports a new TPM (Trusted Platform Module) hostid to uniquely identify a computer, specified as TPM\_ID1 in license files. The TPM hostid is currently supported on Windows platforms only.

As a prerequisite to obtaining and using the TPM hostid, a TPM version 2.0 device must be available and enabled. In addition, the FlexNet Licensing Service must be installed.

If FlexNet Operations is used to generate certificate licenses, version 2017 R3 or later is required in order to support the new TPM\_ID1 hostid.

You can identify the TPM status with FlexNet Publisher using the utilities `lmtpminfo` and `lmhostid`, or the API `lc_tpmstatusget`, or natively in Windows by using the Microsoft Management Console with `tpm.msc` specified, or by using WMI and the `Win32_Tpm` class.

Because `lmadmin` is available only as a 32-bit process, the 32-bit FlexNet Licensing Service must be installed to display TPM details in `lmadmin`'s System Information tab. The 32-bit FlexNet Licensing Service is available from the **i86\_n3** kit. (FNP-17030)

TPM is not currently supported for trusted storage-based licensing.

## Known Issues

On some machines, FlexNet Publisher may fail to extract TPM\_ID1 from the TPM. This is due to a bug in how FlexNet Publisher extracts TPM properties from some earlier TPM drivers. An example of a TPM manufacturer where FlexNet Publisher may fail to extract TPM\_ID1 is IFX, manufacturer version 5.40. (FNP-17441)

In FlexNet Publisher 11.15.0, the LM\_TPM\_PROPS\_NOT\_AVAILABLE (-229 "TPM properties are not available) error code is returned in multiple situations, including when the TPM is disabled, or when it is an old unsupported version, such as v1.2 TPM. In a future release, these error cases will be differentiated with different error codes, respectively LM\_TPM\_DISABLED (-228) and LM\_TPM\_VERSION\_UNSUPPORTED (-227). These two error codes are included in **lmclient.h** but will not be returned in 11.15.0. (FNP-17503, FNP-17067)

## Enhanced options file

### New INCLUDEALL\_ENTITLEMENT/EXCLUDEALL\_ENTITLEMENT options file keywords

The pre-existing INCLUDEALL and EXCLUDEALL options file keywords grant or deny concurrent access to all concurrent licenses, whether they come from certificate licenses or trusted storage.

The new INCLUDEALL\_ENTITLEMENT/EXCLUDEALL\_ENTITLEMENT keywords grant or deny activation of all activatable licenses in served trusted storage.

Note that trusted storage-based hybrid licenses can either be used concurrently or activated. Therefore, to grant or deny access to all concurrent licenses and activatable licenses made available from a hybrid, INCLUDEALL/EXCLUDEALL and INCLUDEALL\_ENTITLEMENT/EXCLUDEALL\_ENTITLEMENT need to be combined in the options file. (FNP-11520, Salesforce 00792327)

## hostid now included in the license server log file

Two new entries have been added to the "Host Info" section of the server log to display the hostid of the license server and the node-locked hostid that was specified in the SERVER line. (FNP-15950, FNP-15307, Salesforce case 01057717)

## Virtualization detection for certificate applications no longer requires FlexNet Licensing Service

From 11.14.1, in order to ensure a fast first-checkout, virtualization detection was delegated to the FlexNet Licensing Service. In 11.15.0, a fast binary detection of virtualization is introduced, which allows use of VM\_PLATFORMS, `ls_allow_vm`, and the **lc\_virtualstatusget** API in certificate applications without having to install the FlexNet Licensing Service (FNP-17081). However, for determining the hypervisor type or extracting a virtualization platform HostID (such as VM\_UUID, AMZN\_EIP) the FlexNet Licensing Service continues to be required.

Similarly, the utility `lmvminfo` will report the detection of a Virtual Environment without the FlexNet Licensing Service being installed, but will not be able to provide any details of the VM attributes without the FlexNet Licensing Service. (FNP-17069, Salesforce case 01307517)

A bug of this feature is if **lc\_virtualstatusget** were to be called from a .Net application, and without the FlexNet Licensing Service installed, it would always return a 'physical' result (ECMC-292).

# Security Updates

## Vendor daemon stability

FlexNet Publisher 11.14.1.3 and later delivers improved resilience of the vendor daemon when receiving unexpected message payloads (FNP-17293). These resilience changes are cumulative to those delivered in 11.14.1.2 (FNP-15986).

## lmadmin httpd.conf file upgrade

The default httpd.conf file provided with `lmadmin` has been updated to prevent previously reported security vulnerabilities. (FNP-16029; Salesforce cases 01045697, 01102780)

## Resolved security vulnerability in lmadmin

A Denial of Service (DoS) vulnerability related to processing a GET /export request has been resolved. (FNP-15972, Salesforce case 01113432)

## lmadmin now built with Visual Studio 2010

`lmadmin` is now built using Visual Studio 2010, instead of using Visual Studio 2008. (FNP-15975, Salesforce cases 01063445, 01137211)

## Resolved server.xml vulnerability

A server.xml vulnerability that occurred when running `lmadmin` as a service has been resolved. (FNP-16648, Salesforce case 00124283)

## Resolved risk of disclosure of sensitive information

A vulnerability existed in non-Windows `lmadmin` systems where setting the Vendor Daemon Log Location (via the `lmadmin` webportal's Vendor Daemon Configuration page) to point to a system file could expose the contents of that system file, via the [View file externally](#) link in the same configuration page.

Now, when using the webportal to configure a vendor daemon log file location, only paths relative to the `logRoot` (set through `-logDir`) can be set. (FNP-16311)

## OpenSSL upgrade

OpenSSL has been upgraded from version 1.0.2h to 1.0.2k in all dependent FlexNet Publisher components. (FNP-15968, Salesforce cases 01102297 and 01124094)

## OpenSSL dependency

Previously the Linux activation library (`libFNP.so`) and FlexNet Licensing Service components had a dependency on OpenSSL. This dependency has been removed. Refer to the Non-Commercial Software Disclosure Document for all components that currently have a dependency on OpenSSL. (FNP-15930)

## Addressed vulnerabilities in FlexNet Licensing Service

Two vulnerabilities have been addressed which guard against the corrupted execution of the Windows FlexNet Licensing Service caused by the transmission of a crafted, invalid message block. This vulnerability has been reported as CVE-2016-10395 (<https://nvd.nist.gov/vuln/detail/CVE-2016-10395>). The fix was introduced in FlexNet Publisher 11.14.1.1. (FNP-15985, FNP-16299, Salesforce cases 01093752, 01093752)

## lmadmin Apache upgrade

`lmadmin` has been upgraded to Apache 2.2.31. (FNP-15973, Salesforce case 01095191)

# Dongle Updates

## FLEXID10 driver update

FLEXID10 drivers have been updated to version 6.40 (previously 6.32) on Windows and Linux. 6.40 is the first version that officially supports Windows 10. (FNP-15979)

## FLEXID9 driver update

FLEXID9 drivers have been updated to version 7.54 (previously 7.5) on Windows, Linux, and OS X. The shared libraries on all these platforms remain unchanged at version 7.50.

## FLEXID9 extraction notes

On OS X platforms, 7.54 drivers do not support extracting FLEXID9 (HASP4 dongles). However, HASP4 dongles are working correctly with 7.54 drivers on Linux and Windows platforms. (7.52 and 7.53 drivers did not work with HASP4 dongles on these platforms.) (FNP-16870)

Additionally, the currently shipping HASP HL PRO dongle (and any subsequent new dongle model) requires use of a third-party-provided updated API for FLEXID9 extraction. Since this 'SRM' API was adopted only from FlexNet Publisher 11.12.1, older FlexNet Publisher versions will be unable to extract FLEXID9 from the HASP HL PRO dongles. Older FlexNet Publisher versions remain compatible with HASP4 and HASP HL dongles. (FNP-16031, Salesforce case 01127984).



**Figure -1:** FLEXID9 dongles (from left to right): HASP4, HASP HL, and HASP HL PRO.

## Platform Updates

### 11.15.0 Updates

#### Windows

The FlexNet Publisher Licensing Toolkit for Windows has been tested on Visual Studio 2017. (FNP-15995, Salesforce cases 01139627, 01136613)

#### Linux

We test recent versions of SUSE Enterprise Linux and Red Hat Enterprise Linux (see [C/C++ Toolkits](#) for specific versions). We do not test other Linux distributions, but would consider as minimum requirements for potential FlexNet Publisher compatibility on a Linux distribution the following: LSB 4.0 compliance and GLIBC-2.7 and Kernel 2.6.27 (FNP-17765).

For the first time, the FlexNet Publisher Licensing Toolkit for Linux has been tested on Ubuntu. Testing was performed against Ubuntu 16. Ubuntu support is experimental in this release.

## OS X

The FlexNet Publisher Licensing Toolkit for OS X has been tested on OS X 10.13.

## Integrated Products and Tested Versions

Product	Tested Version
FlexNet Operations	FlexNet Operations 2017 R4 17.4.0
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2016 R2 SP1 (15.7.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2017 R4

## 11.14.1 Updates

### Windows

Windows Server 2016 has been tested in this release.

### Linux

We test recent versions of SUSE Enterprise Linux and Red Hat Enterprise Linux (see [C/C++ Toolkits](#) for specific versions). We do not test other Linux distributions, but would consider as minimum requirements for potential FlexNet Publisher compatibility on a Linux distribution the following: LSB 4.0 compliance and GLIBC-2.7 and Kernel 2.6.27 (FNP-15725).

## OS X

FlexNet Publisher has been tested on OS X 10.12.

## Integrated Products and Tested Versions

Product	Tested Version
FlexNet Operations	FlexNet Operations 2016 R3 16.3.0
FlexNet Manager for Engineering Applications	FlexNet Manager for Engineering Applications 2016 R1 (15.6.0)
FlexNet Operations Cloud	FlexNet Operations Cloud 2016 R4

## 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 General Issues

#### Fixed naming inconsistency in VM detection mode

The *License Administration Guide* has been modified, specifically Table 12-17, "List of VM\_family and VM\_name and hypervisor supported":

- For Microsoft Hyper-V, the returned hypervisor name has been changed to "HYPERV" to match what `Imvminfo` produces.
- A new row has been added, to detail that the QEMU hypervisor "name" attribute may have the string "-KVM" appended to report "QEMU-KVM" when the presence of the KVM virtualization infrastructure has been detected.

(FNP-16345, Salesforce case 01189144)

#### New SLOG entry for FlexNet Licensing Service status

A new SLOG entry has been added for detecting the FlexNet Licensing Service status and version details.

##### Sample output

- If the latest FlexNet Licensing Service is installed:  
12:20:30 (demo) (@demo-SLOG@) Is FlexNet Licensing Service installed and compatible: Yes  
12:20:30 (demo) (@demo-SLOG@) FlexNet Licensing Service Version: 11.15.0.0
- If the FlexNet Licensing Service is not installed:  
11:48:59 (demo) (@demo-SLOG@) Is FlexNet Licensing Service installed and compatible: No  
11:48:59 (demo) (@demo-SLOG@) FlexNet Licensing Service Version: NA
- If an older version of the FlexNet Licensing Service is installed:  
11:51:08 (demo) (@demo-SLOG@) Is FlexNet Licensing Service installed and compatible: No  
11:51:08 (demo) (@demo-SLOG@) FlexNet Licensing Service Version: NA



- Changed the existing entry for trusted storage access time with new title:

TS access time: <time>

(FNP-14976, Salesforce case 01010708)

## Resolved lmadmin, lmgrd, and Utility Issues

### New systemd-compatible startup script for lmadmin

A new systemd-compatible example startup script has been added to the Linux lmadmin toolkit. This script is available under **lmadmin/examples/systemd/lmadmin.service**. (FNP-16463)

### Resolved issue where no data was written to vendor daemon log after importing an older vendor daemon

Previously, if the following two conditions were met, no data was written to the vendor daemon log file:

- An older vendor daemon (FlexNet Publisher 11.14.1 or earlier) was imported using the lmadmin license server manager of the latest FlexNet Publisher release 11.14.1.1.
- (Windows only) lmadmin was started as a service (created during installation by selecting the **Run as a service** option)

or

(all platforms) lmadmin was started from the command line with the option `-adminOnly yes` (the default).

This issue has now been resolved. (FNP-16540)

### OS X lmadmin now correctly locates dynamic library

Previously, even if OS X lmadmin and the SSL dynamic libraries were in the same folder, lmadmin would be unable to find the dynamic library unless the SSL library was set in (DY)LD\_LIBRARY\_PATH. Now, OS X lmadmin will find SSL dynamic libraries if they are in the same folder. (FNP-15704; Salesforce case 01090042, 01102030)

### Changes to OpenSSL dynamic libraries on OS X

When OpenSSL shared libraries are installed to the same directory as lmadmin (the lmadmin installer's default), it is no longer necessary to set (DY)LD\_LIBRARY\_PATH to the lmadmin installation directory. (FNP-15709)

### lmadmin dashboard displayed incorrect license usage when licenses were queued

Previously, the lmadmin dashboard showed incorrect usage information when licenses were queued. This has now been fixed. (FNP-10426, Salesforce cases 00522687, 00809052, 01066363)

## Full lmadmin version displayed

The lmadmin user interface now displays the full release number with four fields (for example, 11.15.0.0). Previously, only three fields were displayed (for example, 11.14.1). (FNP-16148, Salesforce case 01145039)

## lmadmin now installing as service when relevant option is selected

Previously, lmadmin was not installed as a service when the installer option **Run as a service** was selected in the 32-bit lmadmin installer. This has now been fixed. (FNP-11214, Salesforce case 00735226)

## lmadmin installer includes option for Visual C++ 2010 Redistributable Package in Console and Silent mode

To use lmadmin on Windows platforms, the Microsoft Visual C++ 2010 SP1 Redistributable Package (x86) must be installed. On Windows, the lmadmin installer in all modes (normal, Console, and Silent mode) now enables the user to install the Visual C++ 2010 Redistributable Package (FNP-17145). In Silent mode, the VCREDIST variable can be used to enable the installation of the VC++ 2010 Redistributable Package. (FNP-17448)

## Running lmadmin as a Windows service

Previously, the lmadmin installer for Windows installed the folders and subfolders by default in the **Program Files (x86)** directory, and created the lmadmin service of the type "Local Service", with start-up type "Automatic". As a result, the lmadmin service could fail to start, because it had insufficient privileges to create subfolders in the **Program Files (x86)** directory.

In FlexNet Publisher 11.15.0, the folders that are updated at run time (**conf, logs, cache, licenses**) are installed by default under **ProgramData**. The files, folders, executables, and DLLs that are not modified at run time are installed under **Program Files**.

To perform any operation related to lmadmin, where the **conf** directory is not a subdirectory of the lmadmin installation directory, the **conf** directory must be indicated using the -configDir switch, for example:

```
lmadmin.exe -import counted.lic -configDir "C:\ProgramData\FLEXlm\lmadmin\conf"
```

In addition, new options have been added to the lmadmin installer GUI for Windows:

- The panel **Choose Run-Time Updated Folder** enables the user to set the path for the folders that are created and updated during runtime. The default path is **C:\ProgramData\FLEXlm\lmadmin**.
- The panel **Import Files from Previous Installation** is relevant only if an older installation of lmadmin is present. The new option **Previous Data Folder Path** can be used to import run time data from lmadmin installations where the run time data was installed in a different location than the installation directory.

This fix also resolves outstanding Microsoft Attack Surface Analyser issues and enables lmadmin to run as a service. (FNP-14864, Salesforce cases 01016595, 00978149)

## lmadmin installer updates

In FlexNet Publisher 11.15.0, the lmadmin InstallAnywhere installer no longer bundles the JVM. As a consequence, for Windows, there is now only one lmadmin installer (previously there were two, one for 32-bit bundled JVM, one for 64-bit bundled JVM). (FNP-15969) On OS X, an error no longer occurs where the lmadmin installer prompts the user to install legacy Java software. Now, the lmadmin installer uses the

JVM that is installed on the machine (OS X requires JVM 1.7 or later). To use a different JRE version while installing/uninstalling, the desired version can be specified using the LAX\_VM command. (FNP-15913, FNP-16086, Salesforce case 01112990)

### New license expiration date format in ladmin dashboard

On non-English operating systems, the license expiration dates in the FlexNet License Administrator console had not been localized into the relevant locale but were displayed in English format instead (for example, 30-Dec-2016). Now, the expiration date for all languages is displayed in the format *yyyy-mm-dd*. (FNP-13675, Salesforce case 00834945)

### Improved behavior when starting lmgrd with option “-2 -p”

On Windows systems, if lmgrd is started with -2 -p -local, command-line utilities (**lmreread**, **lmnewlog**, **lmdown**, **lmremove**, and **lmswitch**) can now interact with lmgrd and the vendor daemon, provided the command-line utilities run from the same machine and have LOCALSYSTEM privilege. That is, a local system-privilege Windows service (that calls these command-line utilities) is required when running lmgrd with -2 -p -local. Previously, these command-line utilities would be prevented from interacting with lmgrd when it was started with -2 -p -local.

The fix is specific to lmgrd and the vendor daemon.

(FNP-15761, Salesforce cases 00700550, 00759386, 00799177)

### lmremove improvement

Dequeued clients are no longer abruptly disconnected from the license server after receiving the licenses. The client from which the licenses are removed is now correctly disconnected from the server. (FNP-5882, Salesforce case 01151327)

### Improved expiry date display for permanent licenses in lmstat and lmdiag

For a permanent license, the lmstat and lmdiag output now displays “permanent (no expiration date)” instead of “expiry: 1-jan-0”. (FNP-14351, Salesforce cases 00920617, 01147767)

## Resolved Issues Specific to License File-Based Licensing

### Behavior when a long-running client's floating license expires

Previously, when a client had checked out a served uncounted license, and that license expired, the client would (correctly) enter a reconnection state, but would fail to check out any new licenses that have been made available in the license server via a reread mechanism since the original checkout, and would therefore inappropriately shut down. Now, the client automatically checks out the new license. The fix affects only the license server. (FNP-15023, Salesforce cases 00904244, 01004793, 01043149)

When a client checks out a license using the COAVAIL checkout flag from a pool with multiple licenses, and if one of the feature lines in the license pool expires on the server and is replaced by a feature definition line with a newer license, the client reconnects as expected but may consume more licenses than expected. (FNP-15862, Salesforce case 01224730)

## lc\_hostid() correctly returns adapter list

Adapter details are now retrieved correctly when setting or resetting the attribute LM\_A\_PHYSICAL\_ETHERNETID. (FNP-16718, Salesforce case 01190008)

## Resolved version comparison issue in borrow scenarios

In FlexNet Publisher 11.14.0, a bug was introduced where the borrow checkout failed if the version specified in the FlexEnabled application was not identical (did not have the same number of digits) to the version specified in the license file.

The following example illustrates this bug:

Feature definition line in served license file: `FEATURE f2 demo 10 permanent 50 DUP_GROUP=H BORROW=4320`

- If the version specified in the FlexEnabled application was 10.0, the checkout erroneously failed.
- If the version specified in the FlexEnabled application was 2.0, the checkout erroneously failed.

This bug has now been resolved. Features with a version lower than that specified in the license file are now correctly checked out from the local borrow cache. (FNP-15743, Salesforce case 01104911)

## Resolved threading and concurrency issues on Linux platforms

A number of threading and concurrency issues have been addressed in this release resulting in much cleaner "helgrind" reports when performing license file-based licensing operations. (FNP-10754, Salesforce case 00634660)

## Fixed potential stack-buffer-overflow issue

A potential stack-buffer-overflow issue relating to the `lm_vendor_hostid` structure in **lmclient.h** has been fixed. (FNP-15649)

## Compatibility with BTRFS file systems

FlexEnabled license file-based applications will now successfully run on systems that use a BTRFS file system for the root partition. (FNP-17214)

## lc\_heartbeat again detects expiry of borrowed feature

In a previous release, `lc_heartbeat` did not detect that a borrowed feature had expired and the FlexEnabled application continued to function. This issue has been fixed. (FNP-14197, FNP-15153, Salesforce cases 00904244, 01107720, 01043149)

## Resolved issues related to package licenses

### Package features now check in correctly after using `lmremove` utility

In a package (with `SUITE_DUP_GROUP` set) component checkout scenario, if `lmremove` is used to remove the components in a different order to that in which they were checked out, then the package feature will be checked in correctly. Previously, the package feature failed to check in correctly. (FNP-16451)

### License leakage no longer occurs when using DUP\_GROUP parameter, with PACKAGE and return of borrowed licenses

In FlexNet Publisher 11.14.1.1, the following issue could occur in scenarios where package licenses are used with the DUP\_GROUP parameter: If the same feature is checked out by two clients on two different machines, returning the borrowed license early from the first client, without specifying the feature version, incorrectly results in both licenses being returned to the server. On the second client, the feature can still be checked out until the borrow period expires (a license leakage scenario).

This issue has been resolved. Best practice is to specify the feature version when returning a borrowed license. (FNP-16467)

### Inconsistent licensing behaviour when borrowing with PACKAGE

When a package license is borrowed using either OPTIONS=SUITE or SUITE\_RESERVED with DUP\_GROUP=UH, only one license is now consumed for the parent package. Previously, two licenses were inappropriately consumed. The fix is specific to the vendor daemon. (FNP-15990, Salesforce cases 00801063, 00860898, 01084980)

### lmstat and the linger period displayed for a component of a package

In previous releases, an issue could occur in a package license such as the following:

```
PACKAGE pkg1 demo 1.0 COMPONENTS="f1 f2" OPTIONS=SUITE_RESERVED SIGN=
INCREMENT pkg1 demo 1.0 permanent 2 SUITE_DUP_GROUP=U BORROW SIGN=
```

On successful return of a borrowed f1, lmstat could inappropriately show an active linger period for f1. This issue no longer occurs. (FNP-14398)

### Behavior of LOCALTEST checkouts when using multiple servers on the license path

In 11.14.0.0, a bug was introduced that prevented an LM\_CO\_LOCALTEST checkout with client checkout filter from succeeding when using multiple servers on the license path. The following example illustrates the bug.

#### Scenario

- License path: 27000@Server1;27000@Server2
- Server1 is not running and Server2 serves feature f1

#### Steps

1. lc\_set\_attr(LM\_A\_CHECKOUTFILTER\_EX)
2. lc\_checkout(LM\_CO\_LOCALTEST or LM\_CO\_NOWAIT, f1) succeeds (license checked out from Server2)
3. lc\_checkout(LM\_CO\_LOCALTEST, f1) should now succeed but fails with an error (can't connect to license server).

Correct behavior is restored from 11.14.1.1. The fix requires a client update. (FNP-16272, Salesforce case 01150698)

Note that a consequence of the fix for this issue is a change in the CONFIG and in the error code for the following scenarios.

### Scenario 1:

- License path: 27000@Server1;27000@Server2
- Both servers serve feature f1
- Both servers are initially running

#### Steps

1. Client checkout filter not set
2. `lc_checkout(LM_CO_LOCALTEST, f1)` succeeds (license checked out from Server1)
3. Shut down Server1
4. `lc_checkout(LM_CO_LOCALTEST, f1)` succeeds (license is checked out from Server2). The `lc_test_conf` API returns the CONFIG from Server2, whereas prior to 11.14.0.0, the CONFIG from Server1 was returned incorrectly even though Server1 was down.

### Scenario 2:

- License path: 27000@Server1;27000@Server2
- Both servers serve feature f1, but only Server1 is running

#### Steps

1. Client checkout filter not set
2. `lc_checkout(LM_CO_LOCALTEST, f1)` succeeds (license checked out from Server1)
3. Shut down Server1
4. `lc_checkout(LM_CO_LOCALTEST, f1)` should now fail. Prior to 11.14.0.0, it inappropriately succeeded. In 11.14.0.0 and later, the error code of the checkout with the first license server in the license path is returned. In 11.14.1.1, the checkout attempt is made with the next available server in the license path.

## `lc_checkin()` fails to cancel queued checkout request

A bug was introduced in 11.14.0.0 where `lc_checkin()` from a client fails to cancel a queued checkout request from the same client. This client-side bug has been fixed. (FNP-16030, Salesforce cases 01129573 and 01147599)

## Client with certificate borrowed license does not enter reconnection state

For served licenses that are borrowable: when a client borrowed a floating license and the borrow period expired, it should have but did not enter a reconnection state. An updated client will now enter a reconnection state, then re-checkout licenses from the server until the user checks in their licenses, and the `LM_A_USER_EXITCALL` callback will be called if defined. (FNP-15800, Salesforce case 00904244)

## Fixed incorrect `lmrand` messages

The generation of spurious 'File not found' messages when running `lmrand` has been removed. (FNP-15123, Salesforce case 01037268)

## Queued licenses and LM\_A\_CHECKOUT\_DATA

The following example illustrates a long-standing bug with queuing that has been resolved.

Served license file contains:

```
INCREMENT f1 demo 1.0 permanent 2 SIGN=0
```

### Steps

1. Client1 checks out 2 counts of f1 (all f1 now checked out)
2. Client2 sets LM\_A\_CHECKOUT\_DATA to 'aa'
3. Client2 calls `lc_checkout(f1, ..., LM_CO_QUEUE)` and receives LM\_FEATQUEUE (as expected)
4. Client2 sets LM\_A\_CHECKOUT\_DATA to 'bb' (different checkout data set for the second checkout)
5. Client2 calls `lc_checkout(f1, ..., LM_CO_QUEUE)` and receives LM\_FEATQUEUE (as expected)
6. Client1 checks in 2 counts of f1
7. Client2 calls `lc_status` with different checkout data and inappropriately receives "Success" for one of the checkouts and LM\_USERSQUEUED(-35) for other checkout requests. Now, `lc_status` correctly returns "Success" for all checkouts.

(FNP-14496, Salesforce case 00943234)

## Resolved issues related to BORROW\_LOWWATER keyword

Two bugs related to use of the BORROW\_LOWWATER keyword have been resolved, as shown in the following examples.

### Pooling bug

From served license file:

```
INCREMENT f1 demo 1.0 permanent 1 BORROW SIGN=0
INCREMENT f1 demo 1.0 permanent 1 SIGN=0
```

From options file:

```
BORROW_LOWWATER f1 1
```

### Options file parsing bug

From served license file:

```
INCREMENT f1 demo 1.0 permanent 1 asset_info=123 BORROW SIGN=0
```

From options file:

```
BORROW_LOWWATER f1:asset_info=123 1
```

In both examples, the options file setting should prevent any borrow of f1, but a client could previously inappropriately borrow f1. (FNP-9630)

# Resolved Issues Specific to Trusted Storage–Based Licensing

## Windows FlexNet Licensing Service performance improvement

When upgrading the FlexNet Licensing Service to 11.14.1.0/1/2 while retaining the activation library (libFNP.dll) at a version older than 11.14.1.0, a gradual slowdown of trusted storage operations is observed, due to the gradual accumulation of registry orphan anchors. This has been resolved in FlexNet Licensing Service 11.14.1.3. (FNP-17347, Salesforce 01295425)

## Enhancement to **tsreset** to clean up excess anchor copies

There was a fault in FlexNet Publisher 11.11.1 and earlier on Windows platforms where anchors could be orphaned from the trusted storage file, resulting in additional unnecessary copies being created.

This typically occurs on machines used for FlexNet Publisher testing, for example where the **tsreset** utility is run repeatedly, or where trial anchors are reset.

If the copies build up to large numbers, for example, if resets are run repeatedly in scripts, they can lead to long delays in opening trusted storage for all versions of FlexNet Publisher. A typical symptom of this occurring is an incremental degradation in response time when running activation utilities (of the order of several seconds or longer).

In FlexNet Publisher 11.15.0, **tsreset** has been enhanced to clean up these orphaned anchors.

### Syntax:

`tsreset_app [option]`

`tsreset_svr [option]`

The following options are available:

Option	Description
<code>-reset</code>	Deletes all fulfillment records in trusted storage. On Windows, also deletes orphaned anchors
<code>-reset nottc</code>	Same functionality as <code>-reset</code> , but does not delete the trusted configuration.
<code>-delete</code>	Deletes the trusted-storage data files, but retains the *.sav files. On Windows, also deletes orphaned anchors.
<code>-delete all</code>	Same functionality as <code>-delete</code> , but also deletes the *.sav files.
<code>-logreport</code>	Writes anchor counts to the event log, used to see if orphans are present. (Windows platforms only)
<code>-logreport verbose</code>	Writes details of individual anchors to the event log. (Windows platforms only)



Option	Description
-anchors orphan	Removes only excess anchor copies; it does not reset or delete trusted storage. This enables users to recover from issues related to orphaned anchors without having to re-establish licenses on a production server. (Windows platforms only)

(FNP-15927; Salesforce cases 01201693, 01152391)

### Latency issue on Windows incurred after frequent trusted storage updates

An issue occurred where accessing trusted storage could result in a delay or a hang. This issue occurred only on Windows platforms that use registry anchors, and typically occurred after a sustained period of updating trusted storage, therefore was seen more often with server trusted storage.

A number of factors contributed to this delay, including a weakness in the algorithm for generating unique registry key names for anchor locations, and the inappropriate orphaning of registry based anchors.

The registry anchor algorithms have been substantially updated to:

- improve anchor registry key name generation
- reduce the likelihood of anchors being orphaned
- automatically attempt removal of orphan anchors

(FNP-16400; Salesforce cases 01194103, 01253284, 01203074, 01228008, 01201693, 01191972, 01201693)

## Resolved Issues Specific to Java SDK

### Fixed issue related to loading of Certicom module

Previously, use of the Java SDK might intermittently generate a "Wrong or Incomplete Certicom Module (-515,4030)" error, for example during reload or redeploy of a web page that invokes the LicenseString constructor. This has now been resolved. (FNP-16110, Salesforce case 01114132)

## Known Issues

### Known General Issues

#### Use of hyphens in features names

While hyphens in feature names are not supported (refer to the *Programming Reference for License File-Based Licensing* and *Programming Reference for Trusted Storage-Based Licensing* for valid feature name characters), Flexera has historically allowed hyphens. Hyphens in feature names are still not explicitly

disallowed, but certain inappropriate behaviour may occur when hyphens are used. One example is that a borrow checkout of a feature containing a hyphen may consume additional licenses on the server (FNP-16752).

Flexera recommends using the underscore character instead of hyphens.

## Known Dongle Issues

### FLEXID10 memory leak

A cumulative memory leak on license server which is node locked to FLEXID10 may occur on every heartbeat from the server, or at the client side on every checkout request. The upgrade of FLEXID10 drivers to v6.40 has not resolved this issue (FNP-13944).

### FLEXID10 dongle driver issue

FLEXID10 dongles may not work correctly with the latest v6.40 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)

### FLEXID10 extraction issue

6.40 drivers do not support extracting FLEXID10 from an OS X 32-bit process. (FNP-16413)

### FLEXID10 uninstaller issue

When uninstalling the FLEXID10 (Wibu) driver (v6.40) on Mac OS X platforms, the uninstaller does not remove **libwkextmac.dylib** from the default installer location (**/usr/local/lib**). (FNP-16654)

### FLEXID9 dongle driver installation fails on SUSE Linux

Installation of the FLEXID9 dongle driver on SUSE 12.2 platforms (SUSE Linux Enterprise Desktop 12 SP2 and SUSE Linux Enterprise Server 12 SP2) using the installation archive **aksusbd-redhat-suse-2.4.1.tar.gz** fails, because the dongle driver version 7.5 is not supported on SUSE 12.2 platforms.

As a workaround, perform the following steps:

1. Execute the following command: `systemctl enable aksusbd`
2. Execute the following command: `systemctl start aksusbd`
3. Execute the RPM file and install the driver.

(FNP-16454)

# Known Imadmin Issues

## Imadmin 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).

## Display issues in Imadmin dashboard

If licenses with an expiration date of `PERMANENT` are loaded into trusted storage, the `lmadmin` dashboard (on the Activatable tab) displays the expiration date as `NT . .PE`. (FNP-17658)

If a license file or activatable license is used with an expiration date in the format `dd-mmm-yyyy`, where the day (`dd`) is in the range 1 through 9 (with or without a leading 0, for example, `01-jan-2019` or `1-jan-2019`), the expiration date is not displayed correctly in the `lmadmin` dashboard. (FNP-17686)

These are display issues which do not impact the behavior of `lmadmin`.

## Error when installing Imadmin 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).

# Known Issues Specific to License File–Based Licensing

## lmdia displaying incorrect output in case of multiple vendors

If multiple vendor daemons are served by a single license server manager (such as `lmgrd`), `lmdia` shows an incorrect error message “No such feature exists” for features that are served by one of the valid daemons (FNP-15661, Salesforce case 01202287).

# Known Issues Specific to Trusted Storage–Based Licensing

## Borrow activation to a Linux client causes crash

The **flxActBorrowActivate** function crashes when server Trusted Storage contains an `INCREMENT` line before a `PACKAGE` line (FNP-10437, Salesforce case 00506917).



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**Note** • Only producer-customized back offices can provide licenses with this configuration.

# Known Java Issues

## Limitation of Queuing in Java Clients

When a Java client is set to queuing with 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 incase 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 2017 (11.15.0) 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.

Platform Type	Hardware Type	Operating System
AIX 32-bit	PowerPC	AIX 6.1 ML 006 AIX 7.1 ML 000
AIX 64-bit	PowerPC	AIX 6.1 ML 006 AIX 7.1 ML 000
HP-UX 64-bit	Intel Itanium	HP-UX B.11.23 U ia64

Platform Type	Hardware Type	Operating System
Linux 32-bit	x86	RedHat Enterprise Linux 6 and 7 SUSE Linux Enterprise 11 and 12 Ubuntu 16.04 (experimental support)
Linux 64-bit	x86-64	RedHat Enterprise Linux 6 and 7 SUSE Linux Enterprise 11 and 12 Ubuntu 16.04 (experimental support)
Apple OS X 32-bit and 64-bit	x86 x64	Apple OSX 10.13 Apple OSX 10.12 Apple OSX 10.11 Apple OSX 10.10 Apple OSX 10.9
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 64-bit	x64	Windows 10 Windows 8.1 Windows 7 SP1 Windows Server 2016 Windows Server 2012 and 2012 R2 It is a best practice to run license servers on a server-based OS.
Solaris 32-bit	SPARC 32-bit	Solaris 10 and 11
Solaris 32-bit	x86	Solaris 10 and 11
Solaris 64-bit	SPARC 64-bit	Solaris 10 and 11
Solaris 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.

Platform Type	Hardware Type	Version
Oracle Java Development Kit	• Solaris x86	Java Standard Edition 1.8
	• Solaris x64	
	• Solaris SPARC 32-bit	Java Standard Edition 1.9.0.1
	• Solaris SPARC 64-bit	
	• Windows x86	
	• Windows x64	
	• Linux x86	
	• Linux x64	

## Detailed Platform Information

The following sections list the operating systems and their associated hardware platforms tested with FlexNet Publisher 2017 (11.15.0). 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:

[AIX 32-bit](#)

[Linux 32-bit](#)

[Solaris 32-bit](#)

[AIX 64-bit](#)

[Linux 64-bit](#)

[Solaris 64-bit](#)

[Apple OS 32-bit and 64-bit](#)

[Microsoft Windows 32-bit](#)

[Java Standard Edition](#)

[Microsoft Windows 64-bit](#)

## AIX 32-bit

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

<b>Platform Name</b>	ppc_u
<b>Package Identifier</b>	ppc_u5 (on PowerPC™)
<b>Tested Compiler</b>	PowerPC cc (IBM XLC): 9.0 (AIX 6.1) and 11.1 (AIX 7.1)
<b>Notes</b>	<ul style="list-style-type: none"><li>● lmadm is supported in this toolkit.</li><li>● Short-code transactions are not supported.</li><li>● Prepped Trusted Configuration is not supported.</li><li>● The AIX FlexNet Publisher client libraries are PIC by default; therefore, only one version of these libraries is provided in the toolkit.</li><li>● Java SDK is not supported.</li></ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	No support for tamper-resistant applications. The toolkit is labeled as <i>notr</i> .

## AIX 64-bit

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

<b>Platform Name</b>	rs64_u
<b>Package Identifier</b>	rs64_u5 (on PowerPC™)
<b>Tested Compiler</b>	PowerPC cc (IBM XLC): 9.0 (AIX 6.1) and 11.1(AIX 7.1)

<b>Notes</b>	<ul style="list-style-type: none"> <li>• 1madmin is supported using its 32-bit binary. (No 1madmin 64-bit binary is available.)</li> <li>• Short-code transactions are not supported.</li> <li>• Prepped Trusted Configuration is not supported.</li> <li>• You must use <code>ar -X64</code> and <code>strip -X64</code> on this platform.</li> <li>• The AIX FlexNet Publisher client libraries are PIC by default; therefore only one version of these libraries is provided in the toolkit.</li> <li>• Java SDK is not supported.</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	No support for tamper-resistant applications. The toolkit is labeled as <i>notr</i> .

## HP-UX 64-bit

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

<b>Platform Name</b>	it64_hp (on Intel Itanium)
<b>Package Identifier</b>	it64_hp11i (on Intel Itanium)
<b>Tested Compiler</b>	Intel Itanium HP aC++/ANSI C B3910B A.06.
<b>Notes</b>	<ul style="list-style-type: none"> <li>• 1madmin has not been tested in this toolkit.</li> </ul> <p>On Intel Itanium, use the 1mhostid utility to determine the hostid. This returns the machine identification and is equivalent to the identification returned by the HP_UX command <code>getconf CS_PARTITION_IDENT</code>. For example:</p> <pre>&gt;1mhostid &gt;The FlexNet Licensing host ID of this machine is "ID_STRING=9c788319-db72-d411-af62-0060b05e4c05"</pre> <p>Older methods of obtaining the hostid that return the Ethernet address are still supported, but may fail on some systems. The older methods include:</p> <pre>&gt;uname -i (returns decimal hostid) &gt;1mhostid -long (returns hexadecimal hostid)</pre> <ul style="list-style-type: none"> <li>• Multi-threaded licensing libraries are available on Intel Itanium.</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files.



## Java Standard Edition

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

<b>Platform Name</b>	java
<b>Package Identifier</b>	Not applicable
<b>Tested Compiler</b>	JDK 8 and 9
<b>Notes</b>	<ul style="list-style-type: none"><li>• Implements the FlexNet Licensing for Java client library only.</li><li>• Requires a C development environment.</li><li>• Requires tamper-resistant licenses (TRL) to be enabled.</li></ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	No support for tamper-resistant applications. The toolkit is labeled as <i>notr</i> .

## Linux 32-bit

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

<b>Platform Name</b>	i86_lsb (on x86)
<b>Package Identifier</b>	i86_lsb (on x86)
<b>Tested Compiler</b>	<p>For x86:</p> <ul style="list-style-type: none"><li>• gcc 4.4.4 (RHEL 6.0)</li><li>• gcc 4.1.2 (SUSE 11)</li><li>• gcc 4.3.4 (SUSE 11)</li><li>• gcc 4.8.3 (SUSE 12)</li><li>• gcc 4.8.5 (SUSE 12.3)</li><li>• gcc 5.4.0 (Ubuntu 16.04)</li></ul>

<b>Notes</b>	<ul style="list-style-type: none"> <li>• Imadmin is supported on x86 only.</li> <li>• Multiple Ethernet hostids are supported.</li> <li>• Short-code transactions are supported.</li> <li>• Prepped Trusted Configuration is supported.</li> <li>• Tested virtual machine platforms include: <ul style="list-style-type: none"> <li>VMware ESXi 5.5, 6.0, and 6.5</li> <li>VMware Workstation 11 and 12.5.2</li> <li>Microsoft Windows Server 2016 Hyper-V</li> <li>Microsoft Windows Server 2012 R2 Hyper-V</li> <li>Microsoft Windows 10 Hyper-V</li> <li>Citrix XenServer 6.5 and 7.0</li> <li>Oracle Virtual Box 5.1.26</li> <li>QEMU-KVM (Host OS: CentOS 7.1) <ul style="list-style-type: none"> <li>• Hypervisor: qemu-kvm-ev-2.3.0-31</li> <li>• Hypervisor Services: libvirt-daemon-kvm-1.2.17-13</li> <li>• Virtual Machine Manager: vmm v1.2.1-8</li> </ul> </li> <li>Parallels Desktop 12 for MAC 10.12</li> </ul> </li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

## Linux 64-bit

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

<b>Platform Name</b>	x64_lsb (on x64)
<b>Package Identifier</b>	x64_lsb (on x64)

<b>Tested Compiler</b>	<p>For x64:</p> <ul style="list-style-type: none"> <li>• gcc 4.4.4 (RHEL 6.0)</li> <li>• gcc 4.1.2 (SUSE 11)</li> <li>• gcc 4.3.4 (SUSE 11)</li> <li>• gcc 4.8.5 (RHEL7)</li> <li>• gcc 4.8.3 (SUSE 12)</li> <li>• gcc 4.8.5 (SUSE 12.3)</li> <li>• gcc 5.4.0 (Ubuntu 16.04)</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .
<b>Notes</b>	<ul style="list-style-type: none"> <li>• For the x64_lsb toolkit, lmadm is supported using its 32-bit binary. (No lmadm 64-bit binary is available.)</li> <li>• As a requirement, manually install the Linux 32-bit libraries on RHEL 6.0 (64-bit) or RHEL 7.0(64-bit). (They are not automatically installed with the operating system.) Certain FlexNet Publisher components, such as lmadm, require these libraries. Refer to the RedHat Enterprise Linux documentation for details.</li> <li>• Multiple Ethernet hostids are supported.</li> <li>• Short-code transactions are supported.</li> <li>• Prepped Trusted Configuration is supported (x64_lsb only).</li> <li>• Tested virtual machine platforms include: <ul style="list-style-type: none"> <li>VMware ESXi 5.5, 6.0, and 6.5</li> <li>VMware Workstation 11 and 12.5.2</li> <li>Microsoft Windows Server 2016 Hyper-V</li> <li>Microsoft Windows Server 2012 R2 Hyper-V</li> <li>Microsoft Windows 10 Hyper-V</li> <li>Citrix XenServer 6.5 and 7.0</li> <li>Oracle Virtual Box 5.1.26</li> <li>QEMU-KVM (Host OS: CentOS 7.1) <ul style="list-style-type: none"> <li>• Hypervisor: qemu-kvm-ev-2.3.0-31</li> <li>• Hypervisor Services: libvirt-daemon-kvm-1.2.17-13</li> <li>• Virtual Machine Manager: vmm v1.2.1-8</li> </ul> </li> <li>Parallels Desktop 12 for MAC 10.12</li> </ul> </li> </ul>

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

## Apple OS 32-bit and 64-bit

The following table lists information about the Apple OS 32- and 64-bit systems tested with the FlexNet Publisher Licensing Toolkit:

<b>Platform Name</b>	<ul style="list-style-type: none"> <li>• x86 - i86_mac</li> <li>• x64 - x64_mac</li> </ul>
<b>Package Identifier</b>	<ul style="list-style-type: none"> <li>• universal_mac10_applelibcpp</li> </ul>
<b>Tested Compiler</b>	<ul style="list-style-type: none"> <li>• Xcode 9.0.1</li> <li>• Xcode 7.0.1</li> <li>• Xcode 6.0.1</li> <li>• Xcode 5.1.1</li> <li>• gcc 4.2.1</li> <li>• For 10.9 Apple LLVM version 5.0 (clang-500.2.79) (based on LLVM 3.3svn)</li> <li>• Apple LLVM version 7.0.0 (clang-700.0.72)</li> <li>• Apple LLVM version 8.0.0 (clang-800.0.38)</li> <li>• Apple LLVM version 9.0.0 (clang-900.0.38)</li> </ul>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• 1madmin runs under both the x86 and the x64 Apple architectures using its 32-bit binary. (No 1madmin 64-bit binary is available.)</li> <li>• Multiple Ethernet hostids are not supported.</li> <li>• Short-code transactions are supported.</li> <li>• Prepped Trusted Configuration is supported.</li> <li>• For building requirements, see <a href="#">Requirements for Building the Apple OS X Licensing Toolkit</a>.</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

## Requirements for Building the Apple OS X Licensing Toolkit

When building the FlexNet Publisher Licensing Toolkit on Apple OS X platforms, use the appropriate Apple development environment:

- For OS X 10.9, use Xcode 5.0.2
- For OS X 10.10, use Xcode 6.0.1
- For OS X 10.11, use Xcode 7.0.1
- For OS X 10.12, use Xcode 8.0
- For OS X 10.13, use Xcode 9.0.1

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):

- 32-bit Intel—Runs on OS X 10.9 or later on Intel platforms
- 64-bit Intel—Runs on OS X 10.9 or later on Intel 64-bit platforms

### Required Apple SDKs

The SDK appropriate to the Apple OS X version must be available on the machine where you are building the Licensing Toolkit:

- For OS X 10.9, use **xcode-select --print-path** to obtain the correct path and choose 10.8 or 10.9 SDK path
- For OS X 10.10, use **xcode-select --print-path** to obtain the correct path and choose 10.8, 10.9, or 10.10 SDK path
- For OS X 10.11, use **xcode-select --print-path** to obtain the correct path and choose 10.11 SDK path
- For OS X 10.12, use **xcode-select --print-path** to obtain the correct path and choose 10.12 SDK path
- For OS X 10.13, use **xcode-select --print-path** to obtain the correct path and choose 10.13 SDK path

## Microsoft Windows 32-bit

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

<b>Platform Name</b>	i86_n
<b>Package Identifier</b>	i86_n3
<b>Tested Compiler</b>	<ul style="list-style-type: none"><li>• Visual Studio 2017</li><li>• Visual Studio 2015</li><li>• Visual Studio 2013</li><li>• Visual Studio 2012</li><li>• Visual Studio 2010 Professional Edition</li></ul>

<b>Notes</b>	<ul style="list-style-type: none"> <li>• Imadmin is supported in this toolkit.</li> <li>• Multiple Ethernet hostids are supported.</li> <li>• Short-code transactions are supported.</li> <li>• Prepped Trusted Configuration is supported.</li> <li>• Tested virtual machine platforms include: <ul style="list-style-type: none"> <li>VMware Workstation 11 and 12.5.2</li> <li>VMware ESXi 5.5, 6.0, and 6.5</li> <li>Microsoft Windows 10 Hyper-V</li> <li>Citrix XenServer 6.5 and 7.0</li> <li>Oracle Virtual Box 5.1.26</li> <li>QEMU-KVM (Host OS: CentOS 7.1) <ul style="list-style-type: none"> <li>• Hypervisor: qemu-kvm-ev-2.3.0-31</li> <li>• Hypervisor Services: libvirt-daemon-kvm-1.2.17-13</li> <li>• Virtual Machine Manager: vmm v1.2.1-8</li> </ul> </li> <li>Parallels Desktop 12 for MAC 10.12</li> </ul> </li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

## Microsoft Windows 64-bit

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

<b>Platform Name</b>	x64_n
<b>Package Identifier</b>	x64_n6
<b>Tested Compiler</b>	<ul style="list-style-type: none"> <li>• Visual Studio 2017</li> <li>• Visual Studio 2015</li> <li>• Visual Studio 2013</li> <li>• Visual Studio 2012</li> <li>• Visual Studio 2010 Professional Edition</li> </ul>

<b>Notes</b>	<ul style="list-style-type: none"> <li>• 1madmin is supported using its 32-bit binary. (No 1madmin 64-bit binary is available.)</li> <li>• Multiple Ethernet hostids are supported.</li> <li>• Short-code transactions are supported.</li> <li>• Prepped Trusted Configuration is supported.</li> <li>• The 1mtools utility cannot interact with the license server manager (1mgrd) when 1mgrd is run as a service.</li> <li>• Tested virtual machine platforms include: <ul style="list-style-type: none"> <li>VMware Workstation 11 and 12.5.2</li> <li>VMware ESXi 5.5, 6.0, and 6.5</li> <li>Microsoft Windows Server 2016 Hyper-V</li> <li>Microsoft Windows Server 2012 R2 Hyper-V</li> <li>Microsoft Windows 10 Hyper-V</li> <li>Citrix XenServer 6.5 and 7.0</li> <li>Oracle Virtual Box 5.1.26</li> <li>QEMU-KVM (Host OS: CentOS 7.1) <ul style="list-style-type: none"> <li>• Hypervisor: qemu-kvm-ev-2.3.0-31</li> <li>• Hypervisor Services: libvirt-daemon-kvm-1.2.17-13</li> <li>• Virtual Machine Manager: vmm v1.2.1-8</li> </ul> </li> <li>Parallels Desktop 12 for MAC 10.12</li> </ul> </li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

## Solaris 32-bit

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

<b>Platform Name</b>	<ul style="list-style-type: none"> <li>• x86_sol (on x86)</li> <li>• sun4_u (on SPARC 32-bit)</li> </ul>
<b>Package Identifier</b>	<ul style="list-style-type: none"> <li>• x86_sol10 (on x86)</li> <li>• sun4_u10 (on SPARC 32-bit)</li> </ul>

<b>Tested Compiler</b>	<p>For x86:</p> <ul style="list-style-type: none"> <li>• cc (Sun C) 5.10</li> <li>• cc (Sun C) 5.12</li> <li>• cc (Sun C) 5.13</li> </ul> <p>For SPARC 32-bit:</p> <ul style="list-style-type: none"> <li>• cc (Forte Dev 7) 5.4</li> <li>• cc (Sun C) 5.12</li> <li>• cc (Sun C) 5.13</li> <li>• cc (Sun C) 5.14</li> </ul>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• lmadm is supported in this toolkit.</li> <li>• Synchronous I/O multiplexing, via select, is supported for up to 65,535 file descriptors.</li> <li>• The number of system semaphore arrays can become exhausted.</li> <li>• Shared objects might not run when compiled with gcc on SPARC 32-bit.</li> <li>• Multiple Ethernet hostids are not supported.</li> <li>• Prepped Trusted Configuration is supported.</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

## Solaris 64-bit

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

<b>Platform Name</b>	<ul style="list-style-type: none"> <li>• x64_sun (on x64)</li> <li>• sun64_u (on SPARC 64-bit)</li> </ul>
<b>Package Identifier</b>	<ul style="list-style-type: none"> <li>• x64_sun10 (on x64)</li> <li>• sun64_u10 (on SPARC 64-bit)</li> </ul>



<b>Tested Compiler</b>	<p>For x86-64:</p> <ul style="list-style-type: none"> <li>• cc (Sun C) 5.10</li> <li>• cc (Sun C) 5.12</li> <li>• cc (Sun C) 5.13</li> </ul> <p>For SPARC 64-bit:</p> <ul style="list-style-type: none"> <li>• cc (Sun C) 5.12</li> <li>• cc (Sun C) 5.13</li> <li>• cc (Sun C) 5.14</li> </ul>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• lmadm is supported using its 32-bit binary. (No lmadm 64-bit binary is available.)</li> <li>• Shared objects might not run when compiled with gcc on SPARC 64-bit.</li> <li>• Multiple Ethernet hostids are not supported.</li> <li>• Prepped Trusted Configuration is supported.</li> </ul>
<b>Toolkit Functionality</b>	Licensing based on license files or trusted storage.
<b>Security Functionality</b>	Support for tamper-resistant applications. The toolkit is labeled as <i>standard</i> .

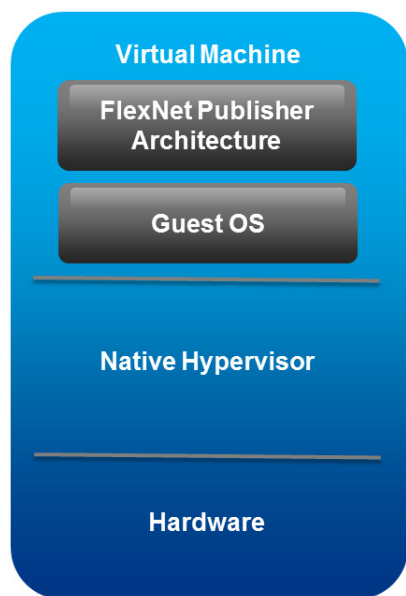
## Toolkits That Support Prepped Trusted Configuration

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)
- universal\_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.

FlexNet Publisher Architecture	Guest OS	Hypervisor	Host ID
i86_n, x64_n	Windows 7 SP1	VMware ESXi 5.5, 6.0, and 6.5	VM_UUID
		Citrix XenServer 6.5 and 7.0	ETHER
		VMware Workstation 11 and 12.5.2	
		Oracle VirtualBox 5.1.26	
		QEMU-KVM	
	Windows 10 Windows 8.1	PARALLELS	ETHER
		VMware ESXi 5.5, 6.0, and 6.5	VM_GENID
		Citrix XenServer 6.5 and 7.0	ETHER
		VMware Workstation 11 and 12.5.2	
		Oracle VirtualBox 5.1.26	VM_UUID
		PARALLELS	ETHER
		QEMU_KVM	

FlexNet Publisher Architecture	Guest OS	Hypervisor	Host ID
i86_n, x64_n	Windows 10	Microsoft Hyper-V from Windows Server 2016	VM_GENID
	Windows 8.1		VM_UUID
	Windows 7 SP1	Microsoft Hyper-V from Windows Server 2012 R2	ETHER
	Windows Server 2012 R2	Microsoft Hyper-V from Windows Server 2012	
	Windows Server 2012	Microsoft Hyper-V from Windows 10 Pro	
	Windows Server 2016	VMware ESXi 5.5, 6.0, and 6.5	VM_GENID
	Windows Server 2012 R2	Citrix XenServer 6.5 and 7.0	VM_UUID
	Windows Server 2012		ETHER
		PARALLELS	VM_UUID
		QEMU-KVM	ETHER
i86_lsb, x64_lsb	RedHat Enterprise Linux 6 and 7	VMware ESXi 5.5, 6.0, and 6.5	VM_UUID
		VMware Workstation 11 and 12.5.2	ETHER
	SUSE Linux Enterprise 11 and 12	Citrix XenServer 6.5 and 7.0	
		QEMU-KVM	
		Microsoft Hyper-V from Windows Server 2016	
		Microsoft Hyper-V from Windows Server 2012 R2	
		Microsoft Hyper-V from Windows Server 2012	
		Microsoft Hyper-V from Windows 10 Pro	
		PARALLELS	
		Oracle VirtualBox 5.1.26	




**Note •**

*VM\_GENID is available from the `lc_hostid` API, but is not available as a `hostid` keyword on the `SERVER` or `FEATURE` line.*

*It is a best practice to run license servers on a server-based OS.*

## 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.

FlexNet Publisher Architecture	Tested OS	Cloud Platform	Host ID
<b>i86_n, x64_n</b>	• Windows Server 2016	Google cloud	License servers:
	• Windows Server 2012 R2	Microsoft Azure	VM_UUID
	• Windows Server 2012		FlexEnabled clients:
	• Windows 10		ETHER
<b>i86_n, x64_n</b>	• Windows Server 2016	Amazon EC2	License servers:
	• Windows Server 2012 R2		VM UUID (previously AMZN_IID)
	• Windows Server 2012		AMZN_EIP
	• Windows 10		FlexEnabled clients: VM_UUID (previously AMZN_IID)
<b>i86_lsb (on x86), x64_lsb (on x64)</b>	• RedHat Enterprise Linux 6 and 7	Google cloud	License servers:
	• SUSE Linux Enterprise 11 and 12	Microsoft Azure	VM_UUID
			FlexEnabled clients:
			ETHER
 <b>Note •</b> <ul style="list-style-type: none"> <li>• Google Cloud is an experimental feature, and is detected as <code>GOOGLE COMPUTE</code></li> <li>• Google Cloud, Amazon EC2 and Microsoft Azure can all use <code>VM_UUID</code>. <code>VM_UUID</code> is equivalent to <code>AMZN_IID</code> on EC2, <code>Google Instance ID</code> on Google and <code>SMBIOS UUID</code> on Azure</li> <li>• For Linux certificate applications, the <code>Linux FlexNet Licensing Service</code> needs to be installed for Azure detection to occur.</li> </ul>			
<b>i86_lsb (on x86), x64_lsb (on x64)</b>	• RedHat Enterprise Linux 6 and 7	Amazon EC2	License servers:
	• SUSE Linux Enterprise 11 and 12		AMZN_EIP or VM_UUID
			FlexEnabled clients:
			VM_UUID

## System Requirements for Imadmin

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

- [Tested Platforms](#)
- [Additional System Requirements](#)
- [Tested Browsers](#)



**Note** • *Imadmin installers are no longer packaged within FlexNet Publisher kit archives, and must be downloaded separately.*

## Tested Platforms

Imadmin has been tested on the following platforms.

Platform Architecture	Processor Type	Operating System
<b>AIX 32-bit</b>	PowerPC	AIX 6.1 and 7.1
<b>AIX 64-bit</b>	PowerPC	AIX 6.1 and 7.1
<b>Linux 32-bit</b>	x86	<ul style="list-style-type: none"> <li>• RedHat Enterprise Linux 6 and 7</li> <li>• SUSE Linux Enterprise 11 and 12</li> <li>• Ubuntu 16 (experimental support)</li> </ul>
<b>Linux 64-bit</b>	x86-64	<ul style="list-style-type: none"> <li>• RedHat Enterprise Linux 6 and 7</li> <li>• SUSE Linux Enterprise 11 and 12</li> <li>• Ubuntu 16 (experimental support)</li> </ul>
<b>Microsoft Windows 32-bit</b>	x86	<ul style="list-style-type: none"> <li>• Windows 10</li> <li>• Windows 8.1</li> <li>• Windows 7</li> <li>• Windows Server 2016</li> <li>• Windows Server 2012 R2</li> <li>• Windows Server 2012</li> </ul>
<b>Microsoft Windows 64-bit</b>	x64	<ul style="list-style-type: none"> <li>• Windows 10</li> <li>• Windows 8.1</li> <li>• Windows 7</li> <li>• Windows Server 2016</li> <li>• Windows Server 2012 R2</li> <li>• Windows Server 2012</li> </ul>
<b>Apple OS 32-bit</b>	x86	Apple OS X 10.9, 10.10, 10.11, 10.12, and 10.13

Platform Architecture	Processor Type	Operating System
<b>Apple OS 64-bit</b>	x64	Apple OS X 10.9, 10.10, 10.11, 10.12, and 10.13
<b>Solaris 32-bit</b>	<ul style="list-style-type: none"> <li>x86</li> <li>SPARC 32-bit</li> </ul>	Solaris 10 and 11
<b>Solaris 64-bit</b>	<ul style="list-style-type: none"> <li>x64</li> <li>SPARC 64-bit</li> </ul>	<ul style="list-style-type: none"> <li>Solaris 10 and 11 (on SPARC 64)</li> <li>Solaris 10 and 11 (on x64)</li> </ul>



**Note** • For non-Windows 64-bit platforms use the 32-bit `lmadmin` installers provided in the `lmadmin` folder of the toolkits. For Windows 64-bit, use the 64-bit Windows `lmadmin` installer.

## Additional System Requirements

`lmadmin` has these additional requirements:

- Linux 32-bit libraries, required by `lmadmin`, are not automatically installed with RedHat Enterprise Linux 6 (64-bit). You must manually install these libraries on this operating system. Refer to the RedHat Enterprise Linux documentation for details.
- To use `lmadmin` on Windows platforms, the Microsoft Visual C++ 2010 SP1 Redistributable Package (x86) must be installed.
- The `lmadmin` installer requires that JRE 1.6 or later (for 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:

- RedHat Linux—Mozilla Firefox 46.x, Google Chrome 61.x
- Windows—Microsoft Internet Explorer 11, Microsoft Edge
- Apple OS X—Apple Safari 6.x and 11

# Deprecated Features and Commands

Deprecated Features and Commands	Comments
License Generator toolkit	License Generator toolkit is deprecated. Instead, the responsegen shared object API has been exposed; see the example <b>.\examples\activation\responsegen\ResponseGenApi.c.</b>
AMZN_IID, HPV_UUID, VMW_UUID	Replaced by VM_UUID
Imbind & LMB_* hostids	Imbind is no longer packaged with FlexNet Publisher archives.  Imbind 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.
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 <b>lc_convert</b> API have been removed from documentation.

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