



## PROTECTION PLUS ENHANCED COMPUTER ID ALGORITHMS

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Protection PLUS has the ability to “lock” your software to the computer on which it is activated. By taking a “fingerprint” of certain hardware pieces of the computer during activation and storing this fingerprint (or Computer ID) in the license file, the application can verify the Computer ID on subsequent executions in order to determine if it is still running on the same computer. This mechanism stops a user from activating the application and copying it to multiple computers still fully activated. There are two Computer ID implementations in Protection PLUS: Legacy Computer ID Algorithms and Enhanced Computer ID Algorithms.

### Overview

The Legacy Computer ID Algorithms allow the developer to select a limited number of hardware and Operating System items to bind including the Windows Product ID key, the format serial number of the hard drive, and the MAC Address of the network card. A single Computer ID number is generated from all the selected algorithms, therefore if any one of these items changes then the Computer ID becomes invalid. This can cause unwanted support for re-activating a customer after small hardware changes such as reformatting their Hard Drive. While the Legacy Computer ID algorithms are still present to allow backward compatibility, they have been deprecated and replaced with a newer mechanism.

The Enhanced Computer ID Algorithms (EID) have replaced the Legacy Algorithms by providing a more robust implementation to lock an application to a computer. The EID utilizes 17 pieces of hardware and Operating System items in addition to a “vote” system to determine if the application is running on the same computer. When an application is activated, a Computer ID number is generated for each of the 17 hardware binding items and each of these Computer IDs are stored internally in the License File. A single 32bit Computer ID is then generated from a subset of the configuration data and this ‘single ID’ is used for activation purposes, just like the legacy Computer ID. Note, only the 32bit ‘single ID’ is available for use through the API, the 17 different configuration items are currently not accessible.

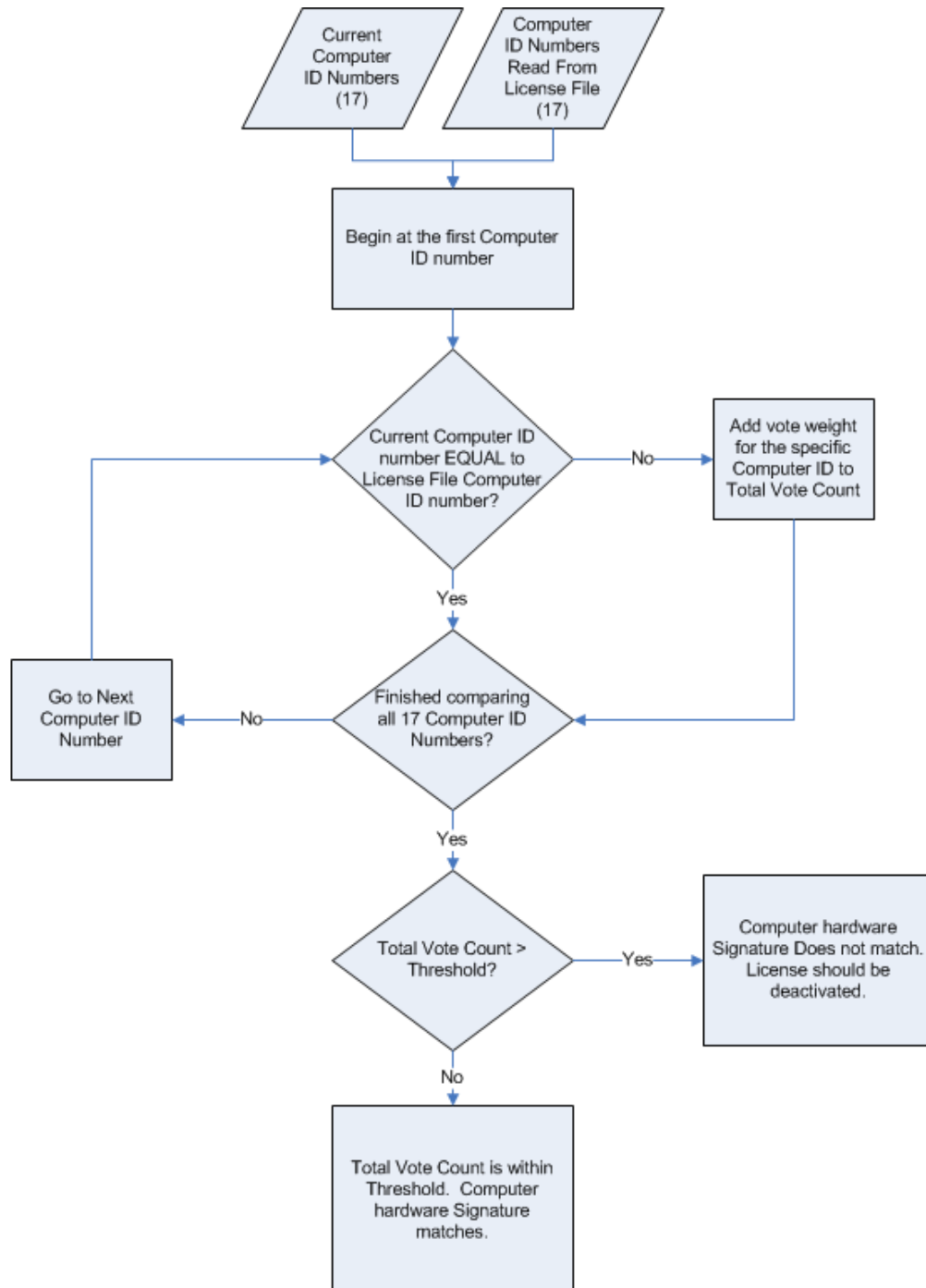
The individual hardware items are assigned a vote weight: a value between 1 and 9. Certain items which may change frequently are assigned a smaller vote weight while items which would rarely change are assigned a higher vote weight. For example, the memory size is assigned vote weight of 2 as it may change more frequently than the motherboard information which is assigned a weight of 9. When an activated license is validated, each individual hardware item is calculated from the current PC configuration and compared to the corresponding hardware item in the License File. If the value for an item has changed the vote weight for that item is added to a total vote count. Once all items are compared the total vote count is checked to see if it is less than a threshold value specified by the developer. If the total vote count is greater than the threshold value then the application is not running on the same computer on which it was activated. Major hardware items generally have a vote weight of 9 and lesser items will have a vote weight between 2 and 3. **We recommend a threshold value of 20 which allows two major hardware changes and one minor change.**

One of the hardware items is the physical serial number of the Hard Drive. Since a computer may have multiple drives, each drive’s serial number is retrieved and when the application is activated all the drive serial numbers (up to four drives) are stored in the License File. On subsequent license checks each current drive’s serial number is compared to each serial number in the License File to find at least one match. This allows the user to add hard drives without the invalidating the license. If at least one drive in

the PC matches the drive list in the License File the vote weight for the Hard Drive serial number is not added to the total vote count. If no drive matches are found then the vote weight is added.

Once every 90 days has passed and the PP\_COPYCHECKTH function is called using the Enhanced Algorithms and the hardware data is within the threshold value, this hardware data in the License File is overwritten by the current computer's hardware data. This allows the user to make gradual hardware changes to their PC without the License deactivating.

### **Flowchart describing Computer ID Number comparison**



## ***Changes to Protection PLUS Functions***

The following Protection PLUS functions have been modified:

**PP\_COMPNO:** the type parameter now accepts COMPNO\_ENHANCED as a computer ID type. This will generate a single LONG (32-bit) number using the enhanced algorithms. This number is used for the User Code 2 field when activating by phone or with SOLO.

**PP\_COPYADD:** the flags parameter now accepts COPYADD\_ENHANCED. By using this flag the current hardware algorithms are acquired from the PC and stored individually in the License File. You can only store one Enhanced Algorithm Computer ID in the License File at one time. Using this flag will replace the existing Computer ID in the License File.

**PP\_COPYCHECKTH:** the flags parameter now accepts COPYCHK\_ENHANCED. By using this flag the current hardware algorithms are acquired and compared individually to the Computer ID data stored in the License File. The total vote count is processed and compared against the threshold. If it is greater than the threshold the function will return PP\_FALSE, otherwise PP\_TRUE is returned. The comp\_num parameter is not used and may be set to 0.

**PP\_COPYDELETE:** If the comp\_num parameter is set to COPYDEL\_ENHANCED the Computer ID data is deleted from the license file.

**PP\_COPYGET:** the slot parameter now accepts COPYGET\_ENHANCED (-1) which will return the single LONG 32-bit Computer ID from the License File.

The EZTrial and EZTrigger functionality is described below under the LFEedit section.

**PP\_TRANSFER:** pass in the flag PP\_TRANSFER\_ENHANCED in the comp\_num parameter to cause a transfer using the new algorithms.

## Upgrading from Existing Algorithms

### EZTrial1 and EZTrial2:

We have added an auto-updating mechanism in the EZTrial1 and EZTrial2 functions. Follow these steps to allow the legacy algorithms to auto-update to the new enhanced algorithms:

1. Create a new license file with the Enhanced Algorithms selected (see LFEEdit Changes below)
2. Distribute this file to your current customer and have them copy over the existing license file, or distribute an update of your application with the new license file.
3. When the application is run the alias licenses will be validated to verify the license is activated on the current PC using the legacy algorithms
4. If the alias files validation passes they are updated to the new algorithms. The old computer ID numbers are deleted and the new algorithms are added.
5. The alias files will then be activated using the enhanced algorithms
6. The main license file will be overwritten by the alias files, thus becoming activated with the new algorithms.

### Not using the EZ functions:

If you have existing customers using the Legacy Algorithms you can automatically update them to the new Enhanced Algorithms. The following pseudo code demonstrates this:

*we are assuming the License File is already opened and we have a valid handle  
Check to see if the License is valid using the Legacy Algorithms.*

```
PP_GETVARIABLE(handle, VAR_EXPIRE_TYPE, buffer)
```

```
IF buffer = "N" OR buffer = "P" Then
```

```
    Make sure the Legacy Computer ID matches
```

```
    comp_num = PP_COMPNO(<Your Legacy Algorithms>, filename, hard_drive)
```

```
    IF PP_COPYCHECKTH(handle, 0, comp_num, threshold) = PP_TRUE
```

```
        The Legacy Algorithm matches so add the new algorithm
```

```
        PP_COPYADD(handle, COPYADD_ENHANCED, 0)
```

```
    The Legacy Algorithm did not match so check if the new algorithms match  
    ELSE
```

```
        IF PP_COPYCHECKTH(handle, COPYCHK_ENHANCED, threshold) = PP_TRUE
```

```
            We are already licensed with the new algorithms
```

```
        ELSE
```

```
            We are not licensed with the enhanced or the legacy algorithms
```

```
        ENENDIF
```

```
    ENENDIF
```

```
ELSE
```

```
    We are not licensed because the Expire Type is not N or P
```

```
ENDIF
```

## LFedit Changes

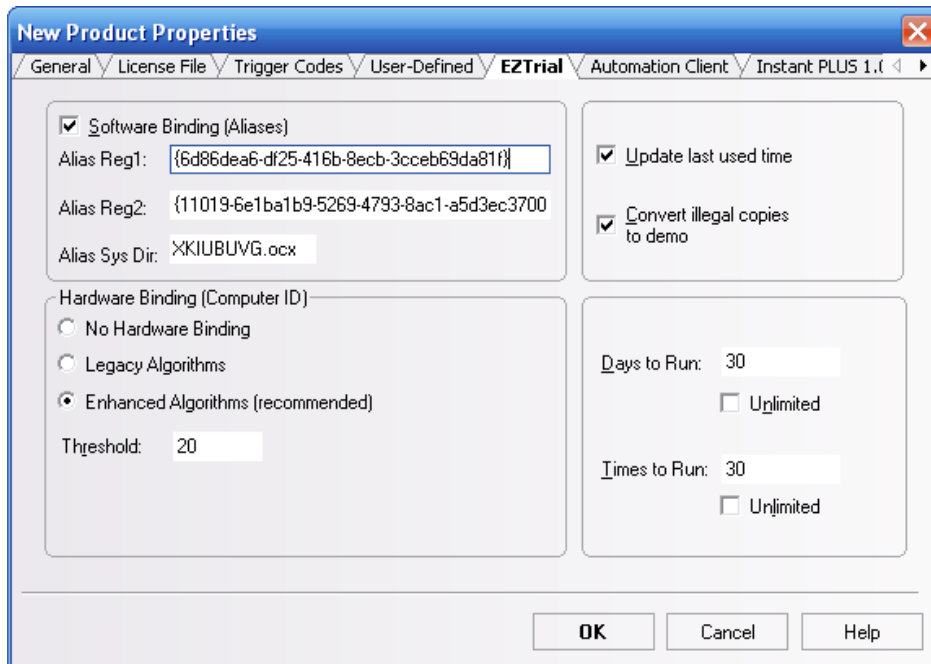
When using LFedit and EZTrial1 or EZTrial2 there are new options under the Product Definition-EZTrial tab in the Hardware Binding Section:

The screenshot shows the 'New Product Properties' dialog box with the 'EZTrial' tab selected. The 'Software Binding (Aliases)' section is checked. The 'Hardware Binding (Computer ID)' section has three radio buttons: 'No Hardware Binding' (selected), 'Legacy Algorithms', and 'Enhanced Algorithms (recommended)'. The 'Days to Run' and 'Times to Run' fields are both set to 30, with 'Unlimited' checkboxes. The 'Update last used time' and 'Convert illegal copies to demo' checkboxes are checked. The 'Alias Reg1' field contains '{6d86dea6-df25-416b-8ecb-3cceb69da81f}', 'Alias Reg2' contains '{11019-6e1ba1b9-5269-4793-8ac1-a5d3ec3700}', and 'Alias Sys Dir' contains 'XKIUBUVG.ocx'. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

**No Hardware Binding:** When using EZTrial the Computer ID is not used nor checked to validate a License.

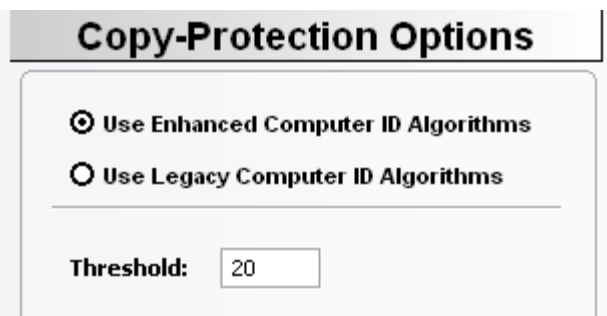
The screenshot shows the 'New Product Properties' dialog box with the 'EZTrial' tab selected. The 'Software Binding (Aliases)' section is checked. The 'Hardware Binding (Computer ID)' section has three radio buttons: 'No Hardware Binding', 'Legacy Algorithms' (selected), and 'Enhanced Algorithms (recommended)'. The 'Legacy Algorithms' section is expanded, showing checkboxes for 'BIOS', 'File Start', 'NetName', 'MAC Address', 'HD SERIAL' (checked), and 'Win ProdID' (checked). The 'Threshold' field is set to 256, 'Drive Letter' is 'C', and 'File Name' is empty. The 'Days to Run' and 'Times to Run' fields are both set to 30, with 'Unlimited' checkboxes. The 'Update last used time' and 'Convert illegal copies to demo' checkboxes are checked. The 'Alias Reg1' field contains '{6d86dea6-df25-416b-8ecb-3cceb69da81f}', 'Alias Reg2' contains '{11019-6e1ba1b9-5269-4793-8ac1-a5d3ec3700}', and 'Alias Sys Dir' contains 'XKIUBUVG.ocx'. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

**Legacy Algorithms:** Select this option to use the previous Hardware Binding Algorithms. Used for backwards compatibility.



**Selecting Enhanced Algorithms** will cause EZTrial and EZTrigger to automatically utilize the new Enhanced Computer ID Algorithms.

## Instant PLUS



Instant PLUS also has the option to use the Legacy Algorithms or the Enhanced Algorithms under the Copy-Protection Options dialog in the wizard.

## ***SOLO and Computer ID Enhanced Algorithms***

When activating a product through SOLO with the Enhanced Algorithms, a single LONG 32-bit number is generated to represent the Computer ID using PP\_COMPNO or automatically when using certain EZTrigger functions. This number is divided into two parts: the upper 16-bits contains a computed number from all the hardware data gathered such as the motherboard serial number, while the lower 16-bits contains a computed number from the Operating System data such as the Windows Product Key. Any algorithms that change from a reinstall of Windows are stored in the lower 16-bits. Once your customer activates the software SOLO stores this Computer ID. Depending on your Product Option settings you can allow SOLO to give another activation code without decrementing the activation count if the customer has reinstalled Windows. Setting the SOLO Unlock Threshold (not the CopyCheck threshold) value in the Product Option settings to 65535 will allow any Operating System changes to be ignored during a re-activation.

### ***CAUTION***

Since the single 32-bit Enhanced Computer ID (the 'single ID') is generated from only a subset of the 17 different pieces of configuration data, it is possible that this can be the same for cloned machines with nearly identical hardware. However, this does not imply the license can be copied between machines with the same 'single ID', since the other configuration data should vary. Due to this limitation, if you distribute your software to corporate environments that may have cloned machines with nearly identical hardware, you should use a SOLO Unlock Threshold (not the CopyCheck threshold) of '-1' to always decrement the Activations Left.