SECURITY
LICENSING
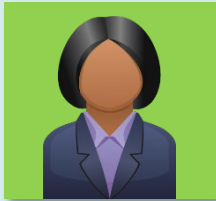**PERFECTION IN PROTECTION**

License Models

Spicing up the Mix

Ruediger Kuegler
VP Sales & Professional Services

Carsten Hoeppner
Professional Services

The Basics of CodeMeter

Software

Software

Software

Software

License
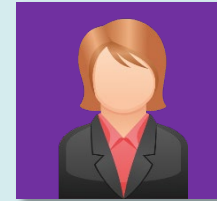- Basic Module
  - Single User
- Additional Module
  - Single User
  - 30 days

License
- Basic Module
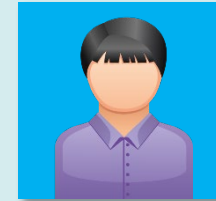 - Subscription
- Additional Module
  - Subscription

License
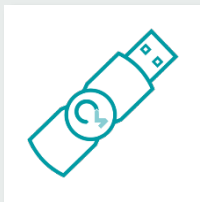- Basic Module
  - 7 Users
- Additional Module
  - 5 Users

License
- Basic Module
  - Single User
  - Pay-per-Use

License Server

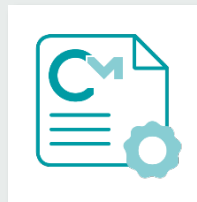License Server in LAN / WAN

CmDongle

License container
in a secure hw element

Bound to a smart card chip

CmActLicense

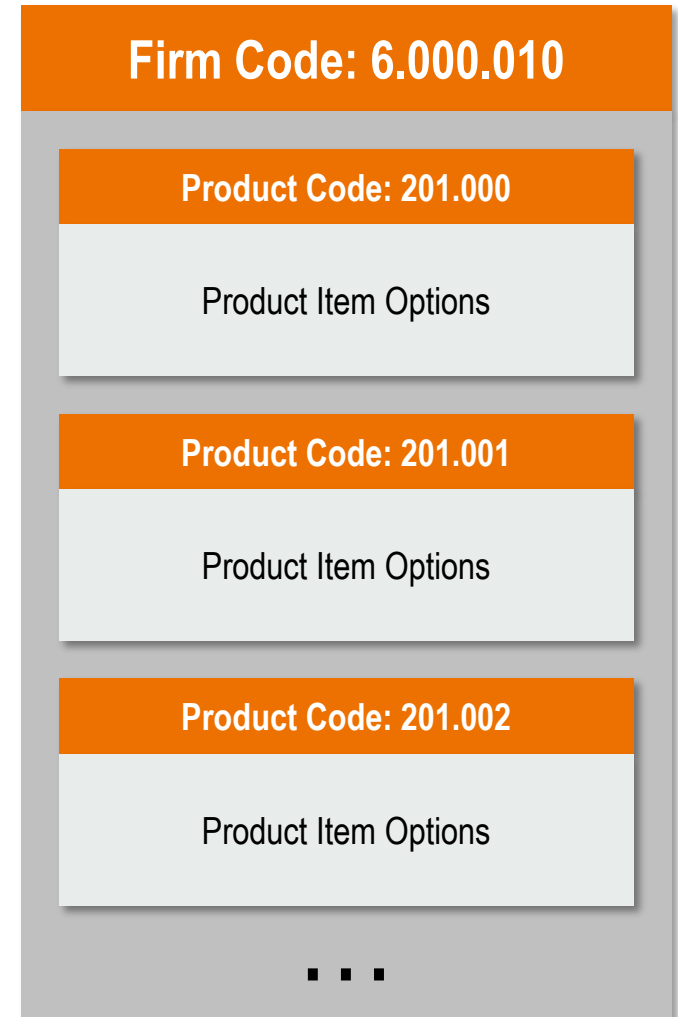License container
in an encrypted file

Bound to an endpoint

CmCloudContainer

License container
in the WIBU cloud

Bound to a user

- License entry = Firm Code | Product Code

- Firm Code: issued by Wibu-Systems

- Product Code:

  - Defined by the software vendor

  - Per Option / Module / Feature

  - 4 bn. Product Codes (UInt32)

- Up to 2,000 Product Items per CmContainer

- Product Item Options: Each license can include combinable options

Firm Code: 6.000.010

> **Product Code: 201.000**
>
> Product Item Options

> **Product Code: 201.001**
>
> Product Item Options

> **Product Code: 201.002**
>
> Product Item Options

. . .

Product Item Options

Text	Module Items	License Transfer
License Quantity	**Unit Counter**	User Data
Activation Time	Maximum Encryption Rate	(Extended) Protected Data
Expiration Time	Access Password	Customer Own License Information
Usage Period	Minimum Runtime Version	Hidden Data
Feature Map	Named User License	Secret Data
Maintenance Period	Linger Time	Universal Data

Product Item 6000010:201000 of CmContainer "<no name>" (3-3869669)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
License Quantity		4	data, serial, counter	10 (LocalOnly)

- Concurrent Licenses, Floating Network Licenses

- Count of the concurrent licenses, both network and stand-alone

- Available access modes:
  - UserLimit
  - StationShare
  - NoUserLimit

Serial Number	3-3869669
CmContainer Type	CmStick/C 3.12
First Device	No drive assigned (HID)
Status	⬤ Enabled
System Time (PC)	2019-07-08 10:43:33
System Time (CmContainer)	2019-07-08 10:43:19
Certified Time (CmContainer)	2017-02-10 13:26:12
Free Memory	94 % (314.096 Bytes)

- All time related options are checked against the internal virtual real-time clock

- Same functional concept for CmDongles and CmActLicenses

- CmStick/T with additional battery-operated clock
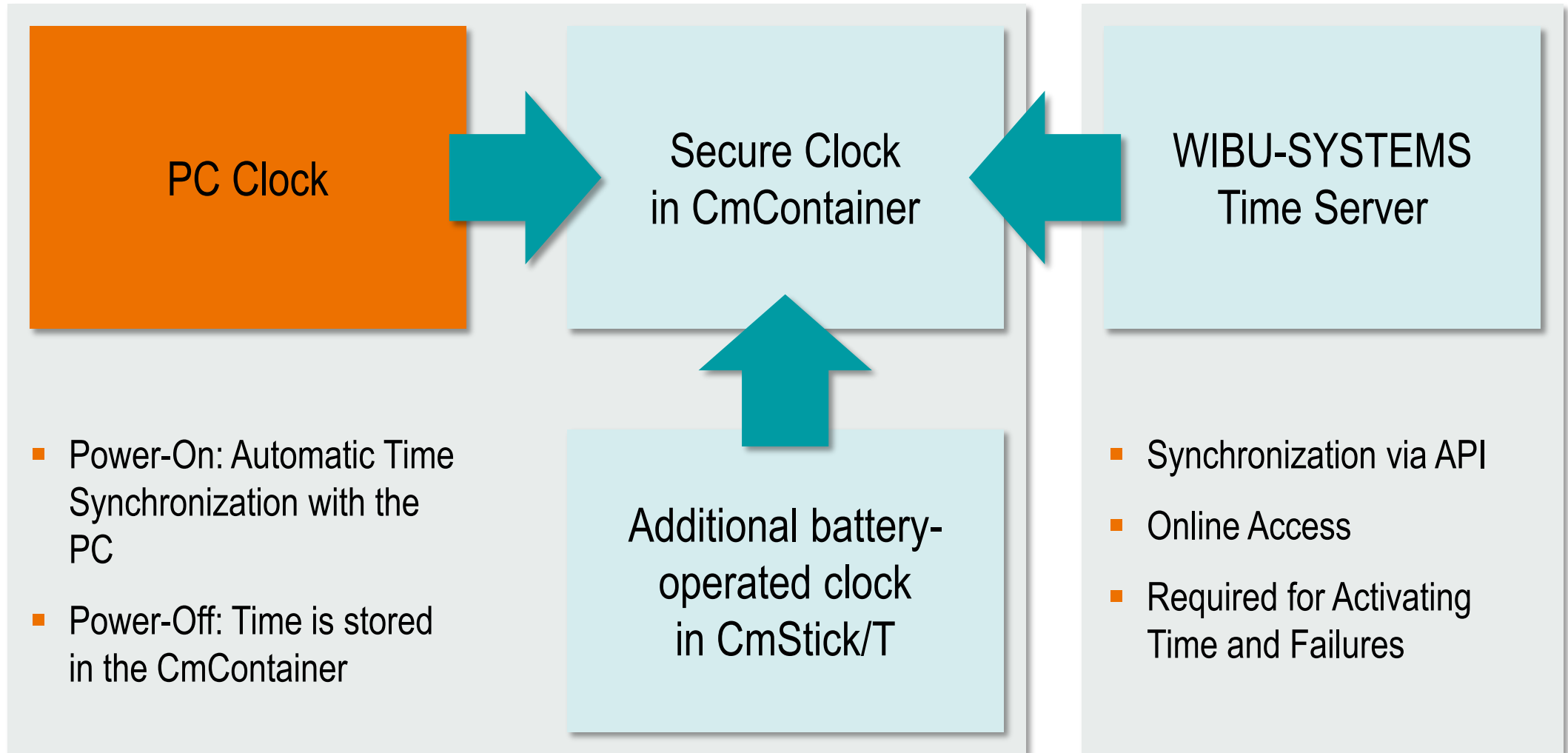
PC Clock

Secure Clock in CmContainer

WIBU-SYSTEMS Time Server

Additional battery-operated clock in CmStick/T

- Power-On: Automatic Time Synchronization with the PC
- Power-Off: Time is stored in the CmContainer

- Synchronization via API
- Online Access
- Required for Activating Time and Failures

Product Item 6000010:201000 of CmContainer "<no name>" (3-3869669)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Expiration Time		4	data, serial, counter	2020-07-04 02:00:00

- License is valid until…

- License is checked against CodeMeter System Time

- Offline use, no Internet connection needed

Product Item Options

Text	**Module Items**	License Transfer
License Quantity	Unit Counter	User Data
Activation Time	Maximum Encryption Rate	(Extended) Protected Data
Expiration Time	Access Password	Customer Own License Information
Usage Period	Minimum Runtime Version	Hidden Data
Feature Map	Named User License	Secret Data
Maintenance Period	Linger Time	Universal Data

- A Module Item is a Product Item inside a Product Item (Nested Product Item)

- A Product Item can contain *n* Module Items

- Nesting level is 1, e.g. Module Items don't include additional Module Items

- A Module Item inherits the Product Item Options of its parent Product Item

  - License Quantity, Maintenance Period, …

- Product Item Options can be overwritten

Firm Code: 6.000.010

Product Code: 1.000

Product Item Options

Product Code: 201.000

Product Item Options

Product Code: 201.001

Product Item Options

. . .

Module Items
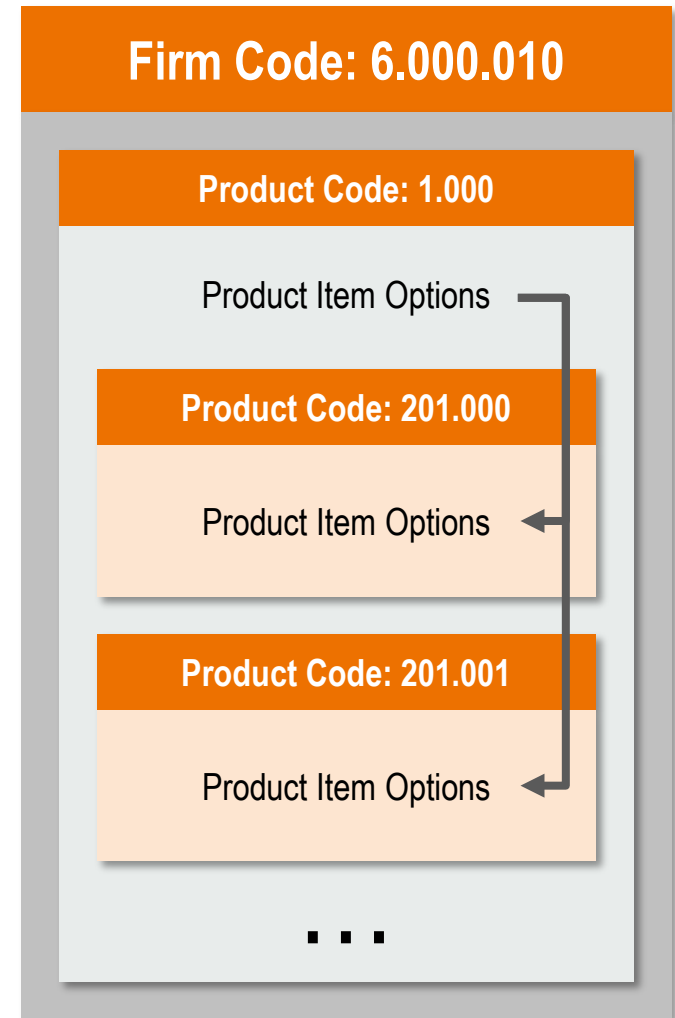
SmartBind 6000010   130-2129231632   CmActLicense/UFC 3.00 ●

⌃ **Licenses**   ⌄ CmContainer Info   ⌄ User Data

⌃ **6000010   Sample Company**   CodeMeter Evaluation License - not for commercial use!

Product Code	Name	Unit Counter	Valid Until	License Quantity	Feature Map
201000	SampleNotePad - Single User	n/a	n/a	1 (local)	0x80000001
↳ 201001	Change Font Module	n/a	n/a	1 (local)	0x80000001
↳ 201002	Hex View Module	n/a	n/a	1 (local)	0x80000001
201999	SampleNotePad - Evaluation	n/a	2020-11-05 14:58:52	1 (local)	0x800001

Product Item Details

Product Item 6000010:201000 des CmContainers "SmartBind 6000010" (130-2129231632)

Product Item Optionen	Typ	Größe (Bytes)	Abhängigkeiten	Wert
Text		38		SampleNotePad - Floating User - Borrow
Feature Map		4	data, serial, counter	0010 0000 0000 0000 0000 0000 0000 0001 (0x20000001)
Lizenz-Anzahl		4	data, serial, counter	10
Extended Protected Data	136	16	data, serial, counter	0x6c 0x63 0x64 0x63 0x00 0x01 0xca 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x02 0x00

Module Items

Product Code	Name
201001	Change Font Module
201002	Hex View Module

Product Item Options

Text	Module Items	License Transfer
License Quantity	**Unit Counter**	User Data
Activation Time	Maximum Encryption Rate	(Extended) Protected Data
Expiration Time	Access Password	Customer Own License Information
Usage Period	Minimum Runtime Version	Hidden Data
Feature Map	Named User License	Secret Data
Maintenance Period	Linger Time	Universal Data

Product Item 6000010:201000 of CmContainer "<no name>" (3-3869669)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Unit Counter		4	data, serial, counter	100

- Count of usage credits

- Pre-paid charging units

- Pay-per-Use based billing

- Counter recharged via FSB

- Decrement at runtime

- Tamper-proof (use of encryption)

Product Item Options

Text	Module Items	License Transfer
License Quantity	Unit Counter	User Data
Activation Time	Maximum Encryption Rate	(Extended) Protected Data
Expiration Time	Access Password	Customer Own License Information
Usage Period	Minimum Runtime Version	Hidden Data
Feature Map	Named User License	Secret Data
Maintenance Period	Linger Time	Universal Data

- **Borrowing** a license from a network server

- Offline use as local license with no connection to the server

- **Temporary transfer** from a CmContainer on a network license server to a CmContainer at the local client

  - The license on the server is shown as allocated ("in use")

  - Expiration Time set for the license in the local CmContainer

- After expiration at local client, the license is available again on the network license server – no action needed by the user

- The user can return the license manually, before it expires

License Models

WIBU SYSTEMS

Single User License	Single User License in a Virtual Machine	**Network License / Concurrent Users**	**Feature-on-Demand License**
Perpetual License	**Demo / Trial License**	**Rental, Leasing, Subscription License**	**Pay-per-Use License**
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	**Borrowable License**	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

Single User License	Single User License in a Virtual Machine	Network License / Concurrent Users	Feature-on-Demand License
Perpetual License	Demo / Trial License	Rental, Leasing, Subscription License	Pay-per-Use License
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	Borrowable License	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

Parent Item (Product)

Child Items (Features/Modules)

License Details

Item Type	ModuleItemParent
Item Id	SNP-201-000-01-101
Name	SampleNotePad - Modular Licenses
Status	active

Module Items

Item Id	Name	ModuleItem Mode	Order Specific Mode	
SNP-201-001-01	Change Font Module	Deselectable	Separate	✏️ ✖️
SNP-201-002-01	Hex View Module	Deselectable	Separate	✏️ ✖️

Modular Licenses – Feature Configuration

Single User License	Single User License in a Virtual Machine	**Network License / Concurrent Users**	Feature-on-Demand License
Perpetual License	Demo / Trial License	Rental, Leasing, Subscription License	Pay-per-Use License
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	**Borrowable License**	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

No License Transfer

CmContainer Type		Activation Count			
SmartBind 6000010	Firm ... 6000010	⌄	1			✖
CmDongle 6000010	Firm ... e: 6000010	⌄	1			✖
					✚

License Transfer Type Schema

<none selected> ⌄

License Entries

Product Code	Action	Option	Operation	Value	Allow value modification	
201000	Add	Product Text	Set	SampleNotePad - Floating User		✎ ✖
		Feature Map	Set	Decimal : 1073741825 Hexadecimal : 0x40000001		
		License Quantity	Set	1, Access permissions: Network	On order	
		Firm Item Text	Set	Sample Co...		

Don't overwrite existing license

Floating Network License

ERP defines amount of seats

WIBU SYSTEMS

Type: Borrow

License Transfer Type Schem	
Name	BorrowLicense
Transfer Type	Borrow license
Max. Borrowing Period	30 Days 0 Hours 0 Minutes 0 Seconds
Transfer Parameter	☐ FirmItem must exist

Transfer Target	
BorrowClient 6000010 | CmActId: 2001	✖
	✚

User can borrow for a maximum of 30 days

Transfer into a CmActLicense

Depends on license model with Wibu-Systems

Borrowing allowed

CmContainer Type		Activation Count			
CmDongle 6000010	Firm 6000010	⌄	1			✖
SmartBind 6000010	Firm e: 6000010	⌄	1			✖
					✚

License Transfer Type Schema

BorrowLicense	⌄

License Entries

Product Code	Action	Option	Operation	Value	Allow value modification	
201000	Add	Product Text	Set	SampleNotePad - Floating User - Borrow		✏ ✖
		Feature Map	Set	Decimal : 536870913 Hexadecimal : 0x20000001		
		License Quantity	Set	1, Access permissions: Network	On order	
		Firm Item Text	Set	Sample Company		

WIBU SYSTEMS

Single User License	Single User License in a Virtual Machine	**Network License / Concurrent Users**	Feature-on-Demand License
Perpetual License	**Demo / Trial License**	**Rental, Leasing, Subscription License**	**Pay-per-Use License**
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	**Borrowable License**	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

Date of next payment + *x* days

ERP defines expiry date

Storage of ticket for automatic renewal

Optional features

License Entries

Product Code				Operation	Value	Allow value mo...		
201000	✎ ✖	Add	Product Text	Set	SampleNotePad - Subscription			✎ ✖
			Feature Map	Set	Decimal : 268435457 Hexadecimal : 0x10000001			
			Expiration Time	Set	2020Jan01,00:00:00	On order		
			Licenseinformation (COLI)	Set		On activation		
			License Quantity	Set	1, Access permissions: Local			
			Firm Item Text	Set	Sample Company			

■ ■ ■

Module Items

Item Id	Name	ModuleItem Mode	Order Specific Mode	
SNP-201-001-01	Change Font Module	Selectable	Separate	✎ ✖
SNP-201-002-01	Hex View Module	Selectable	Separate	✎ ✖
				➕

License Entries

Product Code	Action	Option	Operation	Value	Allow value m...		
201000 ✎ ✖	Add	Product Text	Set	SampleNotePad - Subscription			
		Feature Map	Set	Decimal : 268435457 Hexadecimal : 0x10000001			
		Expiration Time	Set	2000Jan30,00:00:15	On activation	✎ ✖	
		Licenseinformation (COLI)	Set		On activation		
		License Quantity	Set	1, Access permissions: Local			
		Firm Item Text	Set	Sample Company			

■ ■ ■

Module Items

Item Id	Name	ModuleItem Mode	Order Specific Mode	
SNP-201-001-01	Change Font Module	Selectable	Separate	✎ ✖
SNP-201-002-01	Hex View Module	Selectable	Separate	✎ ✖
				✚

Automatic renewal with checkpoints

License Details

Item Type	Default
Item Id	SNP-201-000-01-365
Name	SampleNotePad - Subscription 365
Status	active

Default item, no separate features

Product Code

Extend license, if it exists

Product Version + Marker

License E...

Product C...	Action	...ption	Operation	Value	Allow value modification	
201999	UpdateAdd	Product Text	Set	SampleNotePad - Subscription 365		✏ ✖
		Feature Map	Set	Decimal : 67108865 Hexadecimal : 0x04000001		
		Expiration Time	Add	365		
		License Quantity	Set	1, Access permissions: L...		
		Firm Item Text	Set	Sample Company		
						➕

Add 365 days

- # ERP Triggered
  - ERP System creates a new replace order after each payment
  - Expiration Time = next payment date + *x* days

- # Automatic Renewal
  - Software Activation Wizard renews the license automatically
  - New replace order for final termination of the subscription
  - Expiration Time depends on the settings of the Item

- ## Subscription 365

  - ### Best practice: Simple product structure

  - ### Flexible renewal via all sales channels possible

    - E-Commerce solution, Amazon, local retailer, …

  - ### Expiration Time is set to activation date + 365 days

  - ### If the license already exists, the existing license is extended by 365 days

Single User License	Single User License in a Virtual Machine	Network License / Concurrent Users	Feature-on-Demand License
Perpetual License	Demo / Trial License	Rental, Leasing, Subscription License	Pay-per-Use License
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	Borrowable License	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

Default item,
no separate features

Product Code

Extend license,
if it exists

Add 100 units to
existing license

License Details

Item Type	Default
Item Id	SNP-201-000-01-400
Name	SampleNotePad - Pay Per Use 100
Status	active

License Entitlement

Product Code		Action		Option	Operation	Value	Allow value modification		
201999		UpdateAdd		Product Text	Set	SampleNotePad - Pay Per Use			
				Unit Counter	Add	100			
				Feature Map	Set	Decimal : 33554433 Hexadecimal : 0x02000001			
				License Quantity	Set	1, Access permissions: Local			
				Firm Item Text	Set	Sample Company			

Product Version
+ Marker

- Application needs to count actions

  - Number of starts (CodeMeter Protection Suite, CodeMeter Core API)

  - Runtime of the application, in minutes (CodeMeter Protection Suite, CodeMeter Core API)

  - Clicks or executions of functions (CodeMeter Core API)

- First activation creates a new license

- Following activations add the units to the current value of the existing license

Single User License	Single User License in a Virtual Machine	Network License / Concurrent Users	Feature-on-Demand License
Perpetual License	Demo / Trial License	Rental, Leasing, Subscription License	Pay-per-Use License
License with Maintenance Contracts	License with Downgrade-Right	License with Upgrade-Right	Grace Period License
Volume License	High Availability License	Hot Standby License	Cold Standby License
Overflow License	Borrowable License	Transferable License	Named User License
Computer-bound License	Time Zone License	Country-Based License	…

License Details

Item Type	Default
Item Id	SNP-201-000-01-901
Name	SampleNotePad - Evaluation (All Features)
Status	active

Default item, no separate features

Product Code

Doesn't overwrite existing license

License E...

Product C...		Action	...ption	Operation	Value	Allow value modification		
201999	✕	Add	Product Text	Set	SampleNotePad - Evaluation		✏	✖
			Feature Map	Set	Decimal : 8388609 Hexadecimal : 0x00800001			
			Expiration Time	Add	30			
			License Quantity	Set	1, Access permissions:...			
			Firm Item Text	Set	Sample Company			
		✚						✚

Sets 30 days from activation

License Entries

Product Code	Action	Option	Operation	Value	Allow value modification	
201000	Add	Product Text	Set	SampleNotePad - Evaluation		
		Feature Map	Set	Decimal : 16777217 Hexadecimal : 0x01000001		
		Expiration Time	Add	30		
		License Quantity	Set	1, Access permissions: Local		
		Firm Item Text	Set	Sample Company		

Sets 30 days from activation

Optional features

Module Items

Item Id	Name	ModuleItem Mode	Order Specific Mode	
SNP-201-001-01	Change Font Module	Selectable	Separate	
SNP-201-002-01	Hex View Module	Selectable	Separate	

Pitfalls and False Friends

- ## Usage Period

    - CodeMeter License Central doesn't know when license expires

    ➔ Use relative Expiration Time

- ## Activation Time

    - The user needs to be online (once)

    ➔ Don't use it at all

- ## Feature Map

    - Limited to 32-Bit, no different LQ, ET, …

    ➔ Use Module Items instead

Thank you very much for your attention

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