Release Note CODESYS V3.5 SP11

13.07.2017

1 CODESYS 64 bit (CDS-52665)

COMPATIBILITY_INFORMATION

- The CODESYS Gateway V3 - x64 does not support the communication driver CmpBlkDrvUsb. If this driver is needed, you have to install and use the 32 bit variant of the CODESYS Gateway instead. Both Gateway variants can be used in combination with a 32 and 64 bit CODESYS.
- The CODESYS OPC Server is not available in 64 bit. Therefore no CODESYS OPC Server is included in the 64 bit CODESYS setup.
- The CODESYS V2 project converter is not supported in 64 bit.
- Sending a project archive via mail directly from the "Save Archive" dialog is not supported in 64 bit due to MAPI limitations.
- CODESYS HMI is not available in 64 bit.
- OPC Server is not available in 64 bit.

ADDON_COMPATIBILITY

The following addons are compatible and tested with CODESYS 64 V3.5 SP11:

- CODESYS SoftMotion V4.2.1.2
- CODESYS StaticAnalysis V4.1.1.1
- CODESYS SVN V4.1.2.0
- CODESYS TestManager V4.2.0.0

2 Compatibility information and known limitations

2.1 CODESYS

CDS-53859   DeviceEditorEtherCAT: change EtherCAT modular device profile

COMPATIBILITY_INFORMATION

The ESI xml file import was changed. Logical devices will be now created at the modules and not at the bus coupler any more in case of MDP devices.

Safety devices which are imported in this version are not compatible in older version. Old imported files are still usable.

CDS-52820   Remove V2.3 converter

GENERAL

The feature CODESYS Converter is not avaible in CODESYS 64 Bit.

CDS-35119   Trace editor: flexible assignment of variables to diagrams

GENERAL

This feature will be partially supported starting with programming systems in version 3.5 SP11.

It is possible to configure one or more diagrams within the trace configuration dialog. Each diagram can then display one or more variables and thus it is possible to have a flexible arrangement of variables within diagrams.

All diagrams share the same time axis (as in former multichannel mode) but the appearance including the Y-Axis can be configured separately for each diagram.

KNOWN_LIMITATIONS

It was not possible to realize some parts of this feature yet so the following issues will not be available with the current release and will be implemented afterwards in the followup issue CDS-54939.

- Download and Upload diagram configurations to the PLC
- Save and load diagram configurations in the "trace.csv" format

As the multiselect feature in the configuration dialog did not work consistently before, it was first of all disabled and will be realized consistently in the issue CDS-54580

COMPATIBILITY_INFORMATION

All the configurations that were possible before SP11 are still possible without upgrading the storage format. If a new trace is inserted or if newly available functionality is used then the storage format will be upgraded accordingly.

Opening existing Single-/Multichannel traces will display them in an equivalent way than they were displayed before.

As the configuration of the diagrams is now part of the trace itself the former menu command "Multichannel" (changing the view only) does not make sense any more. It was replaced by two commands new "Convert to Single/Multi Channel" which modify the configuration accordingly.

CDS-50383   Visu, TargetFont: Possibility to add additional font styles into the target font description (like medium or medium italic)

GENERAL

New font styles can be defined for the target fonts. light|light_italic|medium|medium_italic|black|black_italic

To see the result also offline in CODESYS additional WindowsMatchingFonts can be defined.

WindowsMatchingFontLight

WindowsMatchingFontMedium

WindowsMatchingFontBlack

e.g.

```
<ts:section name="TargetFonts">
<ts:section name="Arial">
<ts:setting name="WindowsMatchingFont" type="string" access="visible">
<ts:value>Arial</ts:value>
</ts:setting>
<ts:setting name="WindowsMatchingFontLight" type="string" access="visible">
```

```xml
<ts:value>Arial Narrow</ts:value>
</ts:setting>
<ts:setting name="WindowsMatchingFontMedium" type="string" access="visible">
<ts:value>Arial Narrow|bold</ts:value>
</ts:setting>
<ts:setting name="WindowsMatchingFontBlack" type="string" access="visible">
<ts:value>Arial Black</ts:value>
</ts:setting>
<ts:setting name="Sizes" type="string" access="visible">
<ts:value>10|11|12|14|18|22|30|40|50</ts:value>
</ts:setting>
<ts:setting name="Styles" type="string" access="visible">
<ts:value>light|light_italic|regular|italic|medium|medium_italic|bold|bold_italic|b
lack|black_italic</ts:value>
</ts:setting>
</ts:section>
<ts:section name="Calibri">
<ts:setting name="WindowsMatchingFont" type="string" access="visible">
<ts:value>Calibri</ts:value>
</ts:setting>
<ts:setting name="WindowsMatchingFontLight" type="string" access="visible">
<ts:value>Calibri Light</ts:value>
</ts:setting>
<ts:setting name="Sizes" type="string" access="visible">
<ts:value>10|11|12|14|18|22|30|40|50</ts:value>
</ts:setting>
<ts:setting name="Styles" type="string" access="visible">
<ts:value>light|light_italic|regular|italic|bold|bold_italic</ts:value>
</ts:setting>
</ts:section>
<ts:section name="Berlin Sans FB">
<ts:setting name="WindowsMatchingFont" type="string" access="visible">
<ts:value>Berlin Sans FB</ts:value>
</ts:setting>
<ts:setting name="WindowsMatchingFontMedium" type="string" access="visible">
<ts:value>Berlin Sans FB Demi</ts:value>
</ts:setting>
<ts:setting name="Sizes" type="string" access="visible">
<ts:value>10|11|12|14</ts:value>
```

```
</ts:setting>
<ts:setting name="Styles" type="string" access="visible">
<ts:value>regular|medium|bold|italic|medium_italic|bold_italic</ts:value>
</ts:setting>
</ts:section>
</ts:section>
```

CDS-50510   Core Dump: The core dump commands need to be adapted the new PlcLogic folder structure on the plc

GENERAL

The Core Dump is now aware of the PlcLogic folder structure and finds a Core Dump stored in that folder.

Additionally a new setting is available allowing to define an independent storage path for Core Dumps:

```
[CmpCoreDump]
StoragePath=/some/path
```

CDS-52137   LMM: No Error message for libraries with invalid namespace

COMPATIBILITY_INFORMATION

With Compiler Version >= 3.5.11.0, there will be an error message for Library namespaces that are not valid identifiers according to IEC 61131-3.

If a library is inserted with containing invalid characters in the default namespace, those will be replaced by _.

CDS-51009   Compile: Assertion occures on generate code

GENERAL

From Compilerversion >= 3.5.11.0 onwards the error C0179 is reported when assigning initial values to properties at the declaration of an instance."

CDS-52787   Visu, Linux: Crash after reset in Qt 5 using libGLES (EGLFS)

GENERAL

This issue was fixed using a new setting in the runtime configuration. When setting the value Linux.KeepMainWindowOpen=1 within the section [SysWindow], this problem will no longer occur.

For the following reasons this setting is not active by default:

- This bugfix required a minor change in the behaviour of the targetvisualization (window is kept open all the time)
- This mode has the disadvantage that only one window at a time is possible in X-server based systems
- This mode is thus not recommended at all for X-server based systems
- The crash after reset or download is known only for systems using Qt5 based on EGLFS
- EGLFS is not the recommended (yet working of course) platform for Qt due to typically slower performance (see http://doc.qt.io/qt-5/embedded-linux.html too)

In case of using Linux.KeepMainWindowOpen=1, there is the additional setting Linux.KeepMainWindowOpenShowImmediately which can be used to open that window immediately at startup even if no targetvisualization is running yet.

CDS-53237   Setup: maximum number of files reached

GENERAL

For OEMS building there own installation:

Please follow the steps of article http://flexerasoftware.force.com/articles/en_US/INFO/Q105881 and https://msdn.microsoft.com/en-us/library/aa367767.aspx respectively.

CDS-51582   Core Dump: save values of special marked properties in Online Mode

GENERAL

Properties with {attribute 'monitoring' := 'call'} can additionally be decorated with {attribute 'store_in_core_dump'}.

When creating a Core Dump while logged in to the plc all properties with this attribute will be called and the returned value will be stored in the Core Dump. The values can then be monitored in the Core Dump.

CDS-52064   ASI: Remove from Setup

COMPATIBILITY_INFORMATION

AS Interface Configurator is no longer part of the installation.

CDS-52585   Setup: No Write access to installation folder

GENERAL

For more details see Advisory 2017-04, which is available on the CODESYS website:
https://customers.codesys.com/fileadmin/data/customers/security/2017/Advisory2017-04_CDS-52585.pdf.

A new installation directory remains now protected (only write access by the Administrator).

The installation to a directory with an existing installation will not change the full right access for Everyone. We recommend strongly to use a new installation directory.

COMPATIBILITY_INFORMATION

Windows Runtime Products (CODESYS Control Win V3 - all variants, CODESYS HMI V3, CODESYS Gateway V3):

- The working directory of the runtime product is moved to %ProgramData%\CODESYS\<Product name>\<CRC number> for example C:\ProgramData\CODESYS\CODESYSGatewayV3\BA068C43.
  <Product name> is a placeholder for CODESYSControlWinV3, CODESYSControlSoftMotionWinV3, CODESYSHMIWinV3, …
  <CRC number> is a CRC over the complete installation directory to separate one installation from each other!
- The path of the working directory including the <CRC number> for a specific product can be found in the configuration file (*.cfg) in the installation directory (section [SysFile], key Windows.WorkingDirectory).

- If configuration files from former installations exist in the installation folder and the user confirms the installation directory (against our recommendation), the working directory will remain in the installation directory.

CDS-43388   FEATURE: Web-based Online Help (Step 1)

GENERAL

The default source of context-sensitive documentation (also known as F1-Help) is a web-resource https://help.codesys.com now. If no Internet connection exists or the topic cannot be found on the web-server, the traditional CHM-based help system will be started.

The URL of the web-help server is stored in the assembly configuration file, CODESYS.exe.config; entry "WebHelpServerUrl", current value "http://help.codesys.com"

COMPATIBILITY_INFORMATION-OEM

The Web-based help system can be deactivated permanently with OEM-Customization Hook. Section "OnlineHelp", key "DisableWebHelp", type: Boolean; default: false"

CDS-51727   IO Config: Problems when initial value of declaration and default value of configuration are different

COMPATIBILITY_INFORMATION

Compiler version >= 3.5.11.0 required.

With this compiler version default value for io mappings to existing variables and unmapped channels is not editable any more and initial value is automatically used for default value.

CDS-52789   [Setup]: GWClient 64Bit must be part of 64bit setup

COMPATIBILITY_INFORMATION-OEM

Removed Feature CoDeSys_GWClient from setup. The component gwclient depends on CODESYS feature and has a different 32 and 64 bit variant.

2.2 CODESYS Control

CDS-53086 Various products: Crafted packet may crash runtime - part 3

GENERAL

For more details see Advisory 2017-03, which is available in the customer area on the CODESYS website: https://customers.codesys.com.

CDS-50197 CAA Callback: Callback for ERR_WATCHDOG not working: Hide not working constants

COMPATIBILITY_INFORMATION-EndUser

For callbacks, use CmpEventMgr instead.

CDS-50254 SysPci / Linux: Use libpciaccess to retrieve the information from the PCI bus

COMPATIBILITY_INFORMATION-OEM

On Linux systems the SysPci component now requires the system library libpciaccess.0

CDS-38133 CmpBlkDrvCom/CmpBlkDrvUsb: Should support mainnet-to-mainnet communication in all configurations

COMPATIBILITY_INFORMATION

In the past the block drivers CmpBlkDrvCom and CmpBlkDrvUsb were only used in a subnet configuration of the CmpRouter on CODESYS Gateway side, because in this configuration there is no unique local address for the peers of the serial line needed, which is in opposite to other media (CANopen, UDP, ...) not provided by lower protocol layers. Later on there was the demand to use the driver on both sides e. g. CODESYS runtime system and CODESYS Gateway in a main net configuration. To solve this the protocol of the CmpBlkDrvCom and the CmpBlkDrvUsb were extended to negotiate local addresses between the peers on the serial line. The extension AutoAddressing requires a full-duplex communication line. The option HalfDuplexAutoNegotiate supports also strict half-duplex lines (RS485), but has a somewhat reduced data throughput.To establish the communication it was necessary to configure the settings EnableAutoAdressing und HalfDuplexAutoNegotiate identically on both sides of the line.

Both the CmpBlkDrvCom and the CmpBlkDrvUsb allow now beside the already existing values 0 (disable) and 1 (enable) also the value 2 for the settings EnableAutoAdressing und HalfDuplexAutoNegotiate to detect automatically, whether the protocol extension should be used or not. The value 2 is also the new default value, thus in most cases there is no need to set another value for these two settings. The only exception is, if a runtime system (PLC) itself or the media do only supports half-duplex communication. In this case at least on one side (typically in the PLC) HalfDuplexAutoNegotiate should be set to 1 to force this extension.

In some hot-plug situations, in which one communication peer is replaced by another one, using another or non protocol extension, it may be necessary to restart the remaining communication device the trigger the protocol auto detection again. One example for this is, if first was a device with AutoAddressing connected and then this is replaced by a device using an EnableAutoAdressing=0 configuration.

The new default value of 2 for both settings also use a different default address for the old protocol without any address extension. Thus the default values allow also to communicate to existing devices with both protocol extensions disabled in a mainnet-to-mainnet configuration, which was not possible so far.

Summary:

To take advantage, do not overwrite the new default value of 2 for both settings, except you need to force a half duplex configuration. Only in this case you should set HalfDuplexAutoNegotiate=1.

CDS-47465   Runtime: "STOP to STOP over Reset" behaves differently than "RUN to STOP over Reset"

COMPATIBILITY_INFORMATION-EndUser

Default values for direct addressed outputs are set now, if application is in STOP and a RESET is executed. Previously the direct adressed outputs are not reset in this scenario.

CDS-53357   CmpBlkDrvItf : Increase max number of devices used by CmpBlkDrvUdp (MAX_UDP_DEVICES)

COMPATIBILITY_INFORMATION

The default value for the max. number of CmpBlkDrvUdp instances was increased from 5 to 8. So the Gateway and the CODESYS Control runtime system can now handle and communicate using up to 8 IP addresses (network adapters) without the need of manual configuration.

This value can also be adjusted by:

```
[CmpBlkDrvUdp]
MaxInterfaces=8
```

CDS-49701   MultiCore: Protect setting breakpoints and stepping against multicore execution

KNOWN_LIMITATIONS

Debugging on a multicore system is working.

The only error occurred, if debugging is done in the same IEC code, which is called from several tasks. This is covered by CDS-54238.

CDS-50566   Core Dump: Add possibility in runtime to disable automatic core dump creation

GENERAL

Two new events are introduced, EVT_BeforeCreate and EVT_AfterCreate in CmpCoreDump.

The BeforeCreate event can be used to deny the creation of a Core Dump.

CDS-43921   IecTask Trace: Schedule Tick and Timeslicing should be displayed in TaskTrace

COMPATIBILITY_INFORMATION-OEM

There is a new feature to trace the timing of all IEC-Tasks in a CODESYS device trace (see CmpIecTaskItf.h):

- On MultiCore targets: The code for IecTask trace feature is enable with the compiler switch RTS_IECTASK_ENABLE_TASK_TRACE
- On non MultiCore targets, you can enable the code for IecTask trace with the compiler switch RTS_IECTASK_ENABLE_TASK_TRACE

If the code is available, you can activate the IEC task trace feature with the following setting in the cfg-File:

```
[CmpIecTask]
EnableTaskTrace=1
```

CDS-54237   CODESYSControlService 64bit: Runtime must run as separate service with own SysTray

COMPATIBILITY_INFORMATION-OEM

The runtime CODESYS Control Win 64Bit is running as a separate process with an own Tray-Application. It can be installed and can run in parallel to the 32bit ControlWin.

COMPATIBILITY_INFORMATION-EndUser

The runtime CODESYS Control Win 64Bit is running as a separate process with an own Tray-Application. It can be installed and can run in parallel to the 32bit ControlWin.

CDS-53711   CmpSupervisor: All consumers/watchdogs should be managable

COMPATIBILITY_INFORMATION-OEM

This new aspect can be used the following way:

- ▪ - A hardware watchdog can be registered now the same way as an operation. But you have to set the entry flag RTS_SUPERVISOR_FLAG_WATCHDOG to separate a watchdog from a normal operation
- ▪ - Watchdog can be disabled like a normal operation. But if a watchdog is disabled, the watchdog will not expire, even if at least one operation will fail!
- ▪ - The IoMgr registers now all filedbus watchdogs at the supervisor with the corresponding IoDriver handle. So each watchdog of an IoDriver instance can be disabled resp. didn't expire on a failed vital operation

2.3 Gateway Server

CDS-46542 Gateway: 64 bit platform support

COMPATIBILITY_INFORMATION-OEM

For OEMs calling Gateway functions directly:

The Gateway supports now also 64 bit platforms. As this is a single source project with 32 bit, some datatypes have slightly changed. Examples:

unsinged long --> RTS_UI32

unsinged long --> RTS_UINTPTR

int --> RTS_BOOL

int --> RTS_RESULT

The changes were made binary compatible for 32 Bit Windows applications, but if you recompile your application calling directly the CmpGateway interface, you may have to adapt some datatypes in your code accordingly to avoid compiler warnings/errors.

Additionally for OEMs have written own Gateway communication drivers only:

Some parameter names and types of the CmpGwCommDrv interface of the CmpGateway have changed. Custom code have to be adapted to the new names and types.

CDS-46544 Gateway Client: 64 bit platform support

COMPATIBILITY_INFORMATION-OEM

The GwClient.dll is now also available for 64 bit applications/processes. As this is a single source project with 32 bit, some datatypes have slightly changed. Examples:

unsinged long --> RTS_UI32

unsinged long --> RTS_UINTPTR

int --> RTS_BOOL

int --> RTS_RESULT

The changes were made binary compatible for 32 Bit Windows applications, but if you recompile your application calling directly the GwClient interface, you may have to adapt some datatypes in your code accordingly to avoid compiler warnings/errors.

Furthermore a subset of the GwClient interface functions were exported with decorated (C++) and undecorated namens (C): BeginOpenChannel

BeginOpenChannel2(), BeginCloseChannel(), BeginConnectToGateway(), BeginIncrementalResolveAllNodes(), BeginIncrementalResolveAllNodes2(), BeginIncrementalResolveName(), DisconnectFromGateway(), EndCloseChannel(), EndConnectToGateway(), EndIncrementalResolveAllNodes(), EndIncrementalResolveName(), EnumCommDrivers(), EnumCommDrivers2(), MainClientInit(), MainClientExit(), BeginSendRequest(), EndSendRequest(), EndOpenChannel(), GetInterfaceVersion(), GetRequestStatus().

To keep the project as single source, it was neccessary to remove the undecorated names for these functions. If you have called one of the functions above by the undecorated name, you have to switch over to the decorated name or to use the runtimesystem interface of these component. These functions have basically the same name, but start with the prefix ""GWClient"". For example you can call GWClientBeginOpenChannel() instead of BeginOpenChannel() and so on.

CDS-54602 Gateway doesn't close channels on request, if the byte order of Gateway and GwClient is different

COMPATIBILITY_INFORMATION

The bug was located in the GwClient as well as in the Gateway for Motorola byte order systems. Thus if both the GwClient (for example as internal part of the PLCHandler) and the Gateway are running on Motorola byte order systems none or both have to be updated.

CDS-38133 CmpBlkDrvCom/CmpBlkDrvUsb: Should support mainnet-to-mainnet communication in all configurations

COMPATIBILITY_INFORMATION

In the past the block drivers CmpBlkDrvCom and CmpBlkDrvUsb were only used in a subnet configuration of the CmpRouter on CODESYS Gateway side, because in this configuration there is no unique local address for the peers of the serial line needed, which is in opposite to other media (CANopen, UDP, ...) not provided by lower protocol layers. Later on there was the demand to use the driver on both sides e. g. CODESYS runtime system and CODESYS Gateway in a main net configuration. To solve this the protocol of the CmpBlkDrvCom and the CmpBlkDrvUsb were extended to negotiate local addresses between the peers on the serial line. The extension AutoAddressing requires a full-duplex communication line. The option HalfDuplexAutoNegotiate supports also strict half-duplex lines (RS485), but has a somewhat reduced data throughput.To establish the communication it was necessary to configure the settings EnableAutoAdressing und HalfDuplexAutoNegotiate identically on both sides of the line.

Both the CmpBlkDrvCom and the CmpBlkDrvUsb allow now beside the already existing values 0 (disable) and 1 (enable) also the value 2 for the settings EnableAutoAdressing und HalfDuplexAutoNegotiate to detect automatically, whether the protocol extension should be used or not. The value 2 is also the new default value, thus in most cases there is no need to set another value for these two settings. The only exception is, if a runtime system (PLC) itself or the media do only supports half-duplex communication. In this case at least on one side (typically in the PLC) HalfDuplexAutoNegotiate should be set to 1 to force this extension.

In some hot-plug situations, in which one communication peer is replaced by another one, using another or non protocol extension, it may be necessary to restart the remaining communication device the trigger the protocol auto detection again. One example for this is, if first was a device with AutoAddressing connected and then this is replaced by a device using an EnableAutoAdressing=0 configuration.

The new default value of 2 for both settings also use a different default address for the old protocol without any address extension. Thus the default values allow also to communicate to existing devices with both protocol extensions disabled in a mainnet-to-mainnet configuration, which was not possible so far.

Summary:

To take advantage, do not overwrite the new default value of 2 for both settings, except you need to force a half duplex configuration. Only in this case you should set HalfDuplexAutoNegotiate=1.

2.4 PLC Handler

CDS-54602 Gateway doesn't close channels on request, if the byte order of Gateway and GwClient is different

COMPATIBILITY_INFORMATION

The bug was located in the GwClient as well as in the Gateway for Motorola byte order systems. Thus if both the GwClient (for example as internal part of the PLCHandler) and the Gateway are running on Motorola byte order systems none or both have to be updated.

2.5 Libraries

CDS-7627 Visu: The save as recipe command should check for exisiting files

GENERAL

The check for existing files is only done when the visu input action "ExecuteCommand" "SaveRecipeAs" is used.

All methods from the function block RecipeManCommands do not the check.

CompilerVersion, VisualizationProfile and Libraries >= V3.5.11 necessary

2.6 OPC Server

CDS-55070 Setup: No Write access to installation folder: OPC Server V3

GENERAL

For more details see Advisory 2017-04, which is available on the CODESYS website:
https://customers.codesys.com/fileadmin/data/customers/security/2017/Advisory2017-04_CDS-52585.pdf.

A new installation directory remains now protected (only write access by the Administrator).
The installation to a directory with an existing installation will not change the full right access for Everyone. We recommend strongly to use a new installation directory.

COMPATIBILITY_INFORMATION

CODESYS Gateway V3 as part of CODESYS OPC Server installation:

- The working directory of the CODESYS Gateway V3 is moved to
  %ProgramData%\CODESYS\CODESYSGatewayV3\<CRC number> for example
  C:\ProgramData\CODESYS\CODESYSGatewayV3\BA068C43.
  <CRC number> is a CRC over the complete installation directory to separate one installation from each other!
- The path of the working directory including the <CRC number> for a specific product can be found in the configuration file (*.cfg) in the installation directory (section [SysFile], key Windows.WorkingDirectory).
- If a configuration file from former installations exists in the installation folder and the user confirms the installation directory (against our recommendation), the working directory will remain in the installation directory.
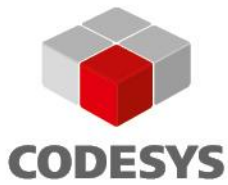
3   Known limitations

VxWorks on Power PC platforms: Not released

The runtime on VxWorks for Power-PC platforms still has unresolved major problems:

- Reset Origin may crash the runtime in certain situations: CDS-55764
- Synchronization issues with IO-Update and/or file access: CDS-55784

We will try to solve these problems as fast as possible, but currently cannot release the CODESYS runtime on VxWorks on PPC.

QNX: Not released

The runtime on QNX currently has problems during task creation, that eventually lead to a deadlock of the system (CDS-55450).

We will try to solve these problems as fast as possible, but currently cannot release the CODESYS runtime on QNX.
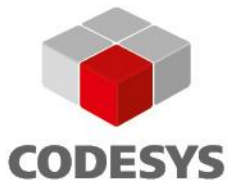
4 OEM information from JIRA

To read up on implemented features and changes you can use your JIRA account. Please find some **example** filters below.

List of features and changes:

fixVersion = "V3.5 SP11"

fixVersion = "V3.5 SP11" AND issuetype = "New Feature"

List of features and changes since CODESYS V3.5 SP10:

fixVersion = "V3.5 SP10 Patch 4" OR fixVersion = "V3.5 SP10 Patch 3" OR fixVersion = "V3.5 SP10 Patch 2" OR fixVersion = "V3.5 SP10 Patch 1" OR fixVersion = "V3.5 SP10"

List of issues with compatibility information:

fixVersion = "V3.5 SP11" AND (text ~ GENERAL OR text ~ COMPATIBILITY_INFORMATION OR text ~ KNOWN_LIMITATIONS)

5 History

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