



VR-Link 3.13.3 Release Notes

This release note provides the following release-specific information for VR-Link Release 3.13.3:

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Systems Supported

Table 1 lists the platforms currently supported by MÄK VR-Link 3.13.3. Table 2 lists the platforms supported by the TENA version of VR-Link. Please contact MÄK if you are interested in purchasing VR-Link for other platforms. Application code must be built with the indicated compilers in order to link to VR-Link libraries.

Table 1: Platforms supported for HLA and DIS

Platform	Compiler
Red Hat Enterprise Linux Workstation 4.0	default compiler
Red Hat Enterprise Linux Workstation 5.0. (32 bit and 64 bit libraries)	default compiler
Fedora 7	default compiler
PC with Windows XP/Vista	Microsoft Visual C++ 7.1 Microsoft Visual C++ 8.0 Microsoft Visual C++ 9.0 (32-bit and 64 bit)

Table 2: Platforms supported for TENA

Platform	Compiler
Red Hat Enterprise Linux Workstation 4.0, 5.0	default compiler
PC with Windows XP/Vista	Microsoft Visual C++ 7.1 Microsoft Visual C++ 8.0

Disk Space Requirements

Linux installations require approximately 80 MB for VR-Link files and an additional 120 MB for documentation files.

On PCs, you need 320 MB for VR-Link files and 120 MB for all documentation files.

Building VR-Link on Linux

VR-Link does not require you to use the MÄK build system, but if you choose to, you must use gmake 3.81 or later. You can download it from the following URL:

<http://savannah.gnu.org/projects/make/>

Compiler Compatibility on Windows

MÄK provides versions of product releases that have been compiled with Microsoft Visual C++ 7.1, 8.0, and 9.0. When you run MÄK products together, for example, the Logger and a VR-Vantage application, we strongly recommend that you run versions compiled with the same compiler. Mixing products compiled with different versions of the compiler can result in program instability.

TENA Compatibility

VR-Link 3.13.3 was built against TENA 5.2.2. The MÄK LROM version is 2.1.

FLEXIm Support

VR-Link 3.13.3 uses FLEXIm 11.8 for all versions except the Windows VC++ 7.1 version, which continues to use FLEXIm 11.6. If you are upgrading from a version of VR-Link that used an older version of FLEXIm, you must replace the files in the license server's FLEXIm directory with the files provided with this release. You do not need a new license. Licenses are forward compatible.

Using Libraries and Binaries Built with Visual Studio 2005 and Later

All MÄK products built with Microsoft Visual Studio require the C Runtime Library to function. The C runtime libraries have always been available from Microsoft for download, they are also installed on a user's machine when a Microsoft compiler is installed. The C runtime libraries are not part of the normal Windows installation. For customers who plan to use MÄK products on machines that do not have a compiler installed, MÄK has historically distributed a copy of the C Runtime Libraries with MÄK products. These libraries were put in the *bin* directory used by the MÄK products. MÄK products would then use the libraries in the *bin* directory and customers would not have a problem if copies of the libraries were not already installed.

Unfortunately, with the release of the new C Runtime Libraries required by Microsoft Visual Studio 2005 (MSVC++8.0) and later, the libraries can no longer just be copied into the *bin* directory of an application. The libraries need to be installed correctly into Windows system folders. (The process is actually a little more complicated, a manifest file needs to be created to tell Windows where to find the libraries.)

To accommodate this change, MÄK is distributing the Windows installer for the C runtime libraries with all MÄK products released for MSVC++8.0 and later. The 32-bit installer is named *vc redistrib_x86.exe*; the 64-bit installer (if supported) is named *vc redistrib_x64.exe*. They are in the base directory of any installed MÄK product that requires them.

Running the installer requires Administrator privileges for the machine the installer is run on. MÄK has chosen to not integrate the MÄK installer and the Microsoft installer so as not to require users to have Administrator privileges to install MÄK products. Therefore, if you who do not have a compiler installed, or get error messages like “Software has not been installed correctly, please re-install”, you must apply the patch.

For more information see this Microsoft URL:

<http://msdn2.microsoft.com/en-us/library/ms235299.aspx>



You must ensure that the preprocessor defines `_SECURE_SCL=0`, and `_HAS_ITERATOR_DEBUGGING=0` are set for MSVC++8.0 and MSVC++9.0 builds. If these are not set, random crashes and assertions may be encountered during runtime."

Patch Required for AMD Dual-processor Windows PCs

VR-Link-based products use a high resolution counter for time calculations on Windows PCs. Customers who are running Windows on PCs with multiple AMD Athlon 64-bit processors may notice clock jitter, which may cause time in MÄK products to run backwards. This occurs when the Windows scheduler changes the CPU the MÄK process is using. If the high resolution counters on each processor are not synchronized, the application may witness a decrease in the high resolution counter value stored in the processor causing an incorrect time calculation. To fix this problem customers, apply the AMD Dual-Core Optimizer patch provided by AMD. You can get the patch at:

http://www.amd.com/us-en/Processors/TechnicalResources/0,,30_182_871_9706,00.html



If you get an error when you try to access this URL, reload the page.

Backward Compatibility

A high degree of compatibility was maintained between 3.12 and 3.13.x. With the exception of specific networking classes all applications should be source compatible. If you are upgrading from VR-Link 3.11 or earlier, be aware that VR-Link's implementation of articulated parts changed in version 3.12. Please see *VR-Link Developer's Guide* for details about the current implementation of articulated parts.

Network Compatibility

HLA only

VR-Link 3.13.3 is compliant with:

- ♦ RPR-FOM 0.5, 0.7, 0.8, 1.0, and a subset of 2.0 (draft 6, 14, and 17)
- ♦ MÄK RTI 2.x, 3.x
- ♦ Pitch RTI 1.3 C++ interface.

Other RTIs that support the HLA 1.3 specification or the SISO DLC HLA API 1516 (SISO-STD-004.1-2004 version of the IEEE 1516 specification.)

DIS only

VR-Link 3.13.3 supports DIS 4, 5, and 6, and can therefore interoperate with DIS applications of any of these versions.

RPR FOM Versions Supported

VR-Link 3.13.3 has built-in support for versions 0.5, 0.7, 0.8, 1.0, and 2.0, drafts 6, 14, and 17, of the RPR FOM. By default, VR-Link 3.13.3 uses RPR FOM 1.0.

VR-Link does not officially support RPR FOM 2 Draft 18 at this time. However, the draft appears to be similar enough to RPR FOM 2 Draft 17 that the 2.0017 FOM Mapper may be used for federates wishing to interoperate with RPR FOM 2 Draft 18.

If you want to use a version of the RPR FOM other than 1.0, pass the version number (0.5, 0.7, 0.8, 2.0006, 2.0014, or 2.0017) to the *DtRprFomMapper* constructor and pass the resulting object to the *DtExerciseConn* constructor. Also, make sure you are using a federation execution name that corresponds to the right FED file. For example:

```
DtExerciseConn conn("VR-Link20017", "MyApp", new DtRprFomMapper(2.0017));
```

VR-Link examples like *f18* and *hlaNetdump* have a command line option, `--rprFomVersion`, that you can use to choose a RPR FOM version, using one of the version numbers listed in the previous paragraph.

RTI Support

VR-Link 3.13.3 has been tested with the Pitch RTI 1.3 and MÄK RTI 3.4.

If you use the MÄK RTI, remember to make sure that VR-Link can find your FED file or FDD file, and optional *rid.mtl*. Put the FED file or FDD file in the directory from which you are running, or set the environment variable `RTI_CONFIG` to the directory that contains it. See *MÄK RTI Reference Manual* for a list of the options for specifying the location of the *rid.mtl* file.

New Features and Changes

VR-Link 3.13.3 is primarily a maintenance release. It has been issued to support the 64 bit Red Hat Enterprise Linux Workstation 5. To use VR-Link 3.13.3, you must upgrade your license server to FLEXlm 11.8. To do this, copy the files from *vrlink3.13.3/flexlm11.8* to the flexlm directory on your license server.

This release also adds a factory method for overriding *DtFom* and a simple example that shows how to do so (*./example/extend/extendFom*).

Bug Fixes

VR-Link 3.13.3 fixes the following bugs:

- ♦ Absolute timestamping was incorrectly decoded in RPR FOM 2.0017. The receive time was not being used for setting location/acceleration/velocity, and so on in the state repository. Instead, the current time was used. This has been fixed for both Spatial and Relative Spatial.
- ♦ Changed *DtHlaObjectManager::reserveName()* to call *evokeMultipleCallbacks* instead of *evokeCallback*. Previously VR-Link would only process the first 100 callbacks and assume the name reservation failed. Now the failure is based on the elapsed time since the name reservation call.
- ♦ It is now possible to unsubscribe from a particular region in HLA 1516. (Added *DtInterClassDesc::unsubscribe(DtDDMRegionSP)*.)
- ♦ VR-Link was not correctly responding to the *requestDivestitureConfirmation* call and RTIs would not complete the divest.
- ♦ Changed the order of sent DI-Guy attributes. Character Type PDU is now sent prior to Character appearance, as appearance interpretation is dependent on Type. Also added a *setDiGuyType* mutator that takes both Character Type and Character Appearance attributes as changing the Type often results in the appearance needing to be changed.
- ♦ Corrected the prototype for *DtEnvironmentTypeRecord* so it does not hide the *DtEntityType* constructors.
- ♦ Added the ability to disable dead reckoning in attached parts. This can be accessed using *DtPhysicalEntityEncoder::setArticulatedPartDeadReckoningEnabled(bool)*, preferred or *DtArticulatedPart::setApproximatingEnabled(bool)*.
- ♦ VR-Link would not correctly join multicast groups when both the device address was specified and a multicast destination address was specified. It now correctly joins the multicast group on the specified device address.
- ♦ *DtAggregateStateRepository* incorrectly decoded *numberOfSilentEntities* in RPR FOM 2.0.
- ♦ Changed *DtCmdLine::SwitchArg::getValue()* to be a const function
- ♦ *DtInetTcpSocket* was correctly closing the socket, but not changing the *DtInetSockState* of the socket. It now closes the socket and marks its state as *DtInetSockState_CLOSED*.

- ♦ In HLA, after an emitter beam addition or removal, post update callbacks are now called on the reflected emitter system to which it belongs.

Known Problems

This release of VR-Link has the following known problems:

- ♦ VR-Link correctly encodes and decodes EnvironmentalProcess objects for RPR FOM 2, Draft 14. However, the RPR FOM specifies a way of encoding which prevents VR-Link from correctly decoding modified or custom EnvironmentalRecords. Unfortunately, many MÄK products built with VR-Link use customized EnvironmentalRecords. If you use these products or if you use customized records in your applications, please do not use the RPR FOM 2 Draft 14 FOM Mapper. This is not a problem in other FOM versions, and it has been resolved in future versions of the FOM.
- ♦ The RTI 1516 API specifies that all strings passed to and from the RTI are handled as wide strings. VR-Link (and the MÄK RTI) store strings internally as narrow strings. This means that true multibyte wide strings used by RTI Federates may not be handled correctly when received by VR-Link. VR-Link handles name reservation wide strings correctly, however, as this is a 1516-only function. VR-Link provides conversion functions from Wide To Narrow/Narrow to Wide string conversion in *vlStringUtil.h*.
- ♦ On non-windows platforms, the classes *DtSharedMemoryPoolManager* and *DtSharedMemoryPoolClient* (*vlShmPool.h*) sometimes have difficulty creating a large memory pool (greater than 1 MB) if the pool name is longer than two or three characters. The classes refuse to create the memory pool even if the requested pool is smaller than the system resource SHMMAX. Setting the pool name to fewer than three characters will work around this problem.
- ♦ Section 6.10 in *VR-Link Developer's Guide* describes interoperability issues that arise when you try to run an HLA 1.3 federate with an IEEE 1516 federate. In particular it describes the requirement to use an identical FED or FDD file for all federates. In future releases, we intend to rectify this situation, and allow run-time interoperability between federates that have loaded a 1.3-style FED file and federates that have loaded a 1516-style XML file that otherwise includes the same set of classes, attributes and parameters.

