

March
2016

What's Up MÄK

Vehicle Crew Training

Training Teams
to Operate
Ground Vehicles
Effectively With
MÄK Products

What's New: VR-Link 5.2.1

Improved Code
Generator and
Java Support
Come to VR-Link

What's New: MÄK RTI 4.4.2

Huge Performance
Gains, Additional
Capacity for
Complex
Simulations

Mentions

New UAV
Simulation Video,
Report from
the Singapore
Airshow, AUSA
Winter Meeting

MÄKer Spotlight: Allison Hebert

Meet the Newest
Member of the
MÄK Team



Ground Vehicle Crew Training

Winning with innovation — Building cost-effective vehicle crew training simulators with MÄK products

For armies around the world, ground vehicles play important tactical roles. Whether they're transporting personnel and cargo as part of a convoy, mobilizing for an offensive maneuver, or defending against a roadside ambush, they are an essential piece of the mobile support and sustainment structure.

The Challenge:

For system integrators winning and delivering crew training simulators: the competition is stiff, the requirements are steep, and the schedules are rigid. They need a technology platform that allows them to meet the requirements while offering innovative or differentiating solutions in their proposal bids. Then when they win, they need a partner who can cost-effectively deliver proven components pre-integrated with state of the art technology and the flexibility to be customized and extended to meet the project's high expectations.

The MÄK Solution:

VT MÄK offers commercial-off-the-shelf (COTS) technology to build crew

trainers, backed by a company with an “engineer down the hall” philosophy to help integrators be successful.

VR-Vantage provides the image generation system for high-detail role-specific visual and sensor scenes. Advanced game-rendering techniques combined with multiple terrain formats enable beautifully realistic scenes using commercial graphics hardware. With a single architecture, integrators can simulate the driver’s vision blocks, externally mounted camera arrays, gunner scopes with targeting overlays, and cartographic maps. The video from multiple sensors can be fed to the commander position, allowing operations while safely inside the cabin, while out-the-hatch views can stimulate a more direct view. The same technology can be used at the instructor/operator stations to monitor and control the exercise from a third-person view, a tactical map display, or from the perspective of any trainee. VR-Vantage can be customized to match performance and resolution needs, and is used on a range of hardware. You can use the same software for a game-like immersive first person virtual view (including virtual vehicle, controls, avatar etc.) to a full simulator where you’re stimulating real or simulated physical equipment.



With MÄK you have choices on how to create the host vehicle simulation. You can use your own high fidelity vehicle model, use VR-Forces, or integrate a 3rd party module. For ground vehicles we’ve found **Vortex**, by CM Labs, to be an excellent vehicle dynamics solution. Vortex’s contact dynamics simulate all the moving parts of the vehicle including the interaction with the terrain, water, obstacles, vision systems, and more. Everything from suspension travel to traction and gearing is accounted for to provide the driver with an enriching, engaging training scenario.

For instructor stations, **VR-Forces** provides a scalable computer-generated forces simulation engine to fill the training environment with friendly forces, hostile opponents, neutral civilians, even animals, structures and other obstacles. VR-Forces allows instructors to pre-plan scenarios as well as interactively create and move units within the scene — altering a live situation in real time. The **MÄK Data Logger** can form the core of your AAR system. It records all the network simulation traffic and allows instructors to mark key events during the simulation for after action review and analysis.

WebLVC provides the opportunity to bring the instructor out of the back room and into direct contact with trainees. With WebLVC, light-weight task specific instructor applications can be developed to facilitate fault injections and trainee specific scenario alterations.



Both VR-Forces and VR-Vantage include MÄK’s **VR-Link** networking technology so your crew station can participate in any DIS or HLA federation. You can use VR-Link’s protocol independent API for any other components within your simulator, that way they will also be able to communicate through industry standard Distributed Interactive Simulation (DIS) protocols and the High Level Architecture (HLA), including HLA 1.3, HLA 1516, HLA Evolved, DIS, and DIS 7. MÄK’s products will work with whatever Runtime Infrastructure is specified when connecting to HLA federations, but we suggest you design your federation using the **MÄK High Performance RTI**.

Want to learn more? [Have a look at the VR-Vantage page](#) for more information.
Interested in [seeing a demonstration](#)?

What's New: Improved Code Generator, Java for VR-Link 5.2.1

VR-Link is the longest-running and most popular MÄK product, so we're always excited to make improvements to it. With the release of VR-Link 5.2.1, our focus is turning to accessibility and ease of use.

The latest version of the code generator has been refined to completely translate your Federation Object Model (FOM) into code with no need for manual entries and edits. This saves developers significant time implementing new protocol messages and makes the code generator easier to use.

Whenever practical, the code generator will map objects and attributes to native VR-Link classes, such as DtString, and DtVector. This lessens the likelihood that simulation developers will have to change their applications to use the new protocol.

VR-Link 5.2.1 introduces Java system compatibility, in addition to its native C++ and C#. Our Java implementation supports DIS and HLA interactions, as well as dead reckoning, smoothing, coordinate conversions, and all the things our customers love about VR-Link. Additionally, C++ FOM Mappers will work with both C++ and Java federates, giving our users FOM agility regardless of programming language.

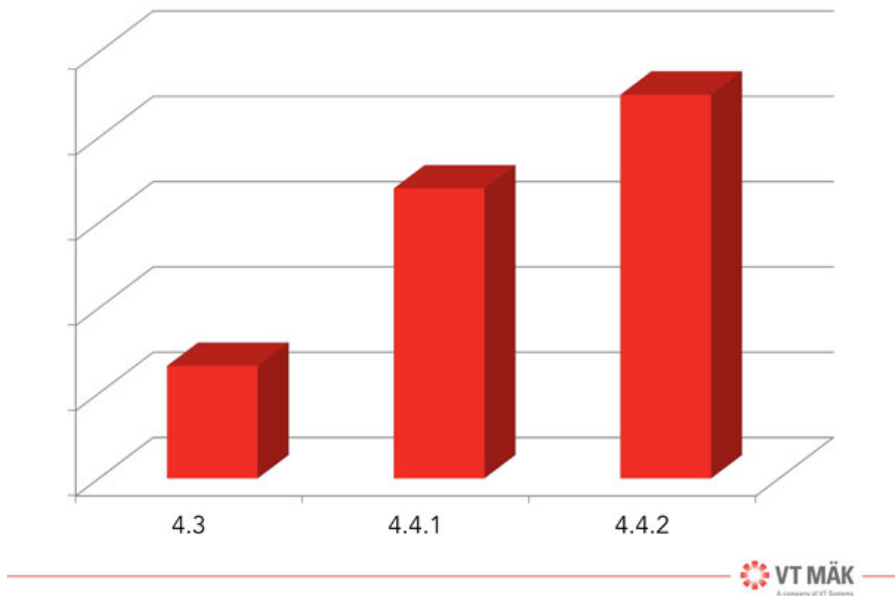
Want to learn more? [Have a look at the VR-Link page](#) for more information.
Interested in [seeing a demonstration](#)?

What's New: Huge Performance Gains for the MÄK RTI

The MÄK RTI enables High Level Architecture (HLA) federations to rapidly and efficiently communicate. Strong performance in an RTI increases a simulation system's capacity for spatial updates, providing higher fidelity to a simulation. With this in mind, we've made significant performance increases for MAK RTI 4.4.2.

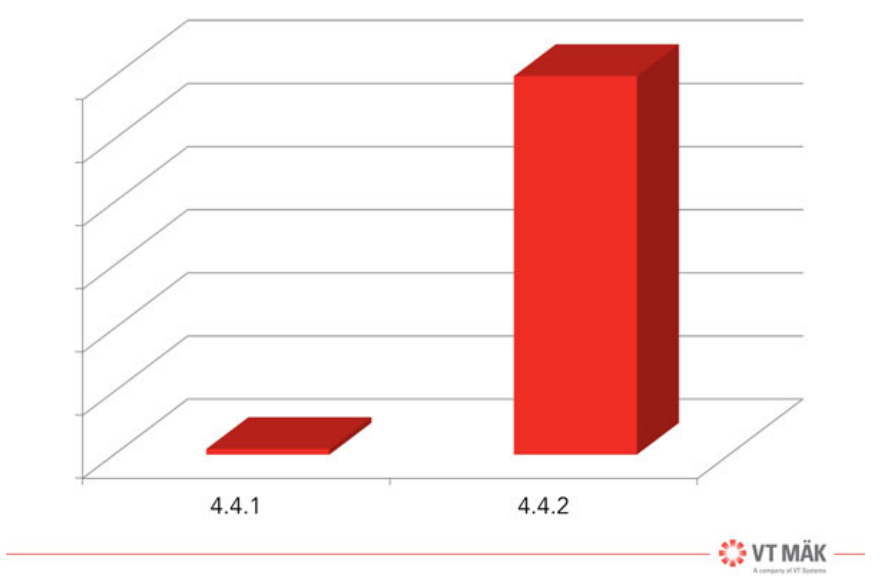
Spatial updates are the most common type of update for most exercises. They occur when a single entity changes position, velocity, acceleration, or orientation. When a simulation contains thousands of entities, updates are constantly pouring in. Therefore, when we measure send and receive performance, we generally test updates that are of spatial update size, or around 100 bytes. In our last release, we more than doubled the number of updates that the RTI can handle. In this release, we now have added another 30% on top of that, now more than tripling the RTI's 2014 performance.

Spatial Updates Per Second



When an object first appears in a real-time exercise (usually at the start), it must be registered by the RTI. If a large simulation contains hundreds of thousands of entities, it can take time for everything to be found which can become an issue when processing messages in real-time. MÄK RTI 4.4.2 has increased its object registration performance to over 60x its previous benchmark, making it an ideal tool for large and complex simulations.

Objects Registered Per Second



Time-managed exercises require even faster RTIs in order to process data at a higher speed than real-time. This is particularly helpful when running Monte Carlo simulations, which require multiple simulations of similar scenarios. For our customers requiring time managed performance, the MAK RTI 4.4.2 sends messages 9x faster than its predecessor.

For customers who prefer to use Java, we've spent considerable engineering resources to bring our Java support up to the quality of our C++ and C# support. The new Java bindings are an order of magnitude faster than before, now on par with the native version. Now you can choose your preferred programming language without sacrificing performance.

Want to learn more? [Have a look at the MÄK RTI page](#) for more information. Interested in [seeing a demonstration](#)?

Mentions

[Check out this great new video of a UAV surveillance mission simulation!](#) It shows off VR-Forces' modeling and visualization capabilities, including communications modeling, strike aircraft, and battle damage assessment. It also ties in very closely with the [UAV surveillance Use Case](#) that was featured last month- learn what our customers use to assemble this training system.

We are excited to announce the release of [VR-Vantage 2.1](#)! Whether you are an IG user developing immersive first person experiences, or a Stealth user visualizing missions and developmental prototypes, there are new features that improve VR-Vantage for everyone.

Releases are imminent for [VR-Link](#), [VR-Forces](#), [RadarFX](#), the [MÄK RTI](#), and the [MÄK Data Logger](#)! [Join the MÄK Community today](#) and be the first to know when they are available.

We brought an awesome flight demo featuring dual roles for a pilot and sensor operator to the Singapore Airshow in February. [Read Dan Brockway's report from Singapore!](#)

We will be attending the [AUSA Winter show](#) this month! Check out [our events calendar](#) to learn more about what we're planning for upcoming shows and who will be representing MÄK.



MÄKer Spotlight: Allison Hebert, The Newest MÄKer!

We are excited to welcome Allison Hebert to the MÄK Team, and congratulate her on her new role as Office Manager in Cambridge!

As Office Manager, she is responsible for organizing events, placing orders, timesheet administration, general office administration and facilities management. She is also involved in accounting, benefits, and HR.

Prior to MÄK, Allison was an Office Assistant at Izotope in Cambridge. In the past she worked as a Program Coordinator for an adult-literacy focused non-profit.

Allison received her BA in English from California Baptist University in southern California. She has also participated in

independent fiction-editing classes.

When Allison isn't overseeing the office, she enjoys singing, playing the guitar, writing fiction, swing dancing, photography, and trying amazing coffees.

We hope we've piqued your interest in getting to know the MÄK team! Stay tuned to our [blog](#) and [Twitter](#) to get the latest on MÄK happenings!