# MONTAVISTA SOFTWARE

# Tech Brief:
# Case Study of Migrating to MVShield Support for CentOS in an OpenRAN Deployment

## Introduction

In this Tech Brief, we describe a customer success story adopting the MontaVista MVShield support service that we believe acts as a good practical guideline for the market and other interested users. It also underlines some of the fundamental considerations pertaining to supporting an Enterprise Linux distribution.

The customer in question had an existing installed base across service provider customers deploying OpenRAN in different use-cases. This platform runs on the mainline open-source CentOS distribution. What we describe in more detail are the steps MontaVista and the customer took together to migrate their installed base to MVShield and give some insight to the initial experience the customer, as well as MontaVista, went through deploying the service.

We also cover some of the initial "trials by fire" when the customer deployments were hitting some runtime support issues and how MontaVista and the MVShield service delivered - and handled these scenarios that Carrier Grade support is really meant for.

This document assumes some familiarity with the CentOS and Rocky Linux concepts like package management, the types of repositories available and the release cadence. However, no detailed technical understanding of the operating systems is required.

# Setup and Initial migration

The initial steps for a successful migration are sharing information about the customer's installation. This approach is essentially defining the customer's CentOS or Rocky Linux branch that MontaVista will continue to support and maintain.  The key components are typically determined by the installed CentOS distribution package content, the kernel version and the source repositories used, as well as any potential non-CentOS custom applications a customer would like to include into the MVShield service.

In this specific customer case, the package list and kernel version (two kernel versions in this instance) were already well defined and contained only packages that are a part of the CentOS Core and Appstream repositories. MontaVista reviewed the package list, and it was accepted as a baseline of the MVShield service as such, greatly reducing the effort required for the migration, since the customer could reuse the platform without changes.  The only requirement for the customer in these cases is to replace the source RPM repository they use for their platform maintenance to use the MontaVista MVShield repositories, that provide an automatic update feed going forward for the customer chosen content.

Typically, the MVShield "branch support" methodology allows customers to choose a list of packages, as well as specify the baseline Rocky or CentOS Linux release that acts as a base. MontaVista will provide production grade backporting services for any security vulnerabilities or defects on that exact baseline. For example, CentOS Linux 7.5 or other already vaulted baselines from the CentOS project could be used as a baseline release. MontaVista also generally is ok with the packages that are already deployed at customers, with restrictions applying to content that is under a proprietary license or otherwise the base source code is not available to MontaVista to provide support

services. Furthermore, MontaVista will continue to support the customer specific baseline for +10 years.  Meaning, a customer will not need to migrate to minor or major versions to receive CVEs.  MontaVista will apply the update stream directly to the customer's baseline version, even if it requires a backport.

Targeting their OpenRAN deployment using containers, the customer also required some specific adaptations to support the Universal Base Image (UBI) containers on the base CentOS branch. The container repository can have an accompanying package stream that has different build settings from the base CentOS, providing optimized size RPM packages, however, when using the UBI baseline, the packages are matching those of the base distribution, providing more synergy with risk management and maintenance.

MontaVista fulfilled this need with extra services that are very commonly deployed to support use-case specific requirements. Going forward the customer will have access to the preconfigured default UBI container configuration through the MVShield standard service, that they can extend to support their custom container setup, targeting the core OpenRAN DU/CU infrastructure.

The standard release cadence provided by MVShield is quarterly. However, any critical fixes and/or explicitly requested fixes from the customer can be addressed asynchronously. Through the years of experience MontaVista has gathered such a stable vs continuous -release hybrid solution is typically ideal for customer organizations.

The following diagram depicts the usage of the MVShield repositories on a high level.
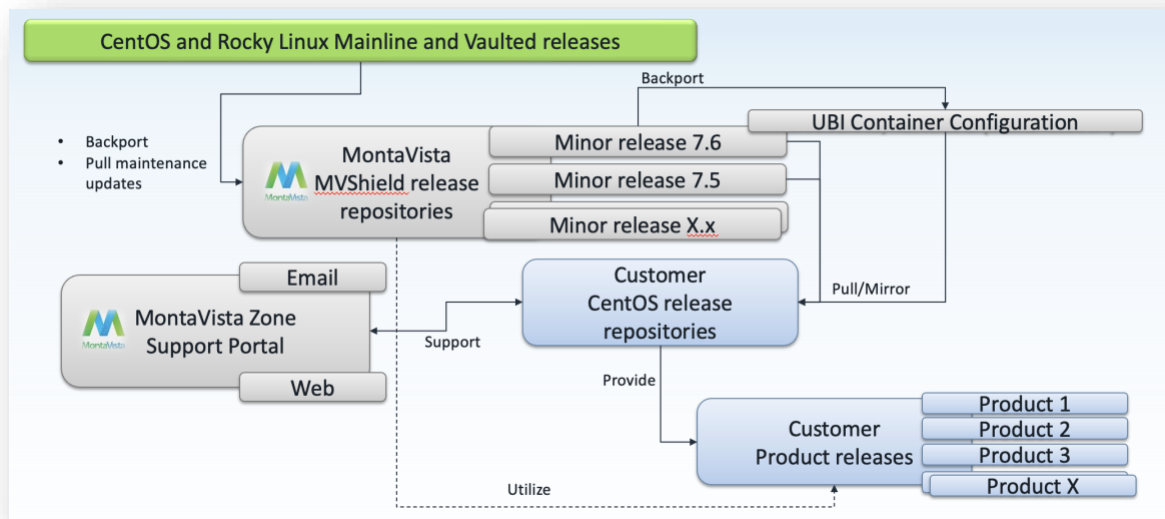
## Support, Contracts, and the Service Level Agreement

Often the core of any support program, besides the maintenance offering, is the Service Level Agreement (SLA) that governs most importantly the response times delivered by the vendors organization. Often, customers want to match the SLA requirements to those of their end-customer to have minimal risk between the stages of delivery when supporting their products.



MVShield therefore allows very configurable SLAs, with the standard product offering productized templates, which are most often than not adapted for larger customer organizations.

For this use case, the customer had also agreed to certain terms with their end customers, the OpenRAN-enabled service providers. The SLA required by them was matching a typical carrier-grade high-availability spec that MontaVista is accustomed to, including very aggressive response times for P1 and P2 issues.

MVShield provided for the customer explicit response times across four different levels of security and defect tickets (P1-P4), in decreasing priority level. MontaVista assigned a dedicated response team inside the support organization, with set escalation procedures to facilitate handling the customer tickets. This included setting up emergency response with 24/7 support and sub-hour response times to be there immediately should a critical issue surface at the customer deployment.

MontaVista has always aimed to have a guiding principle of flexibility also to the business arrangements between companies. Since MVShield serves various customer needs, it has a flexible business model that, while based on standard policies, allows also significant adaptation based on the customers need. Also in our target scenario, the customer had evolving requirements around the chosen base platform details that MontaVista continuously addressed, providing consultative help to the customer to find the most optimal deployment model, timing, and configuration. The following image depicts the support capability deployed for MVShield at the customer:
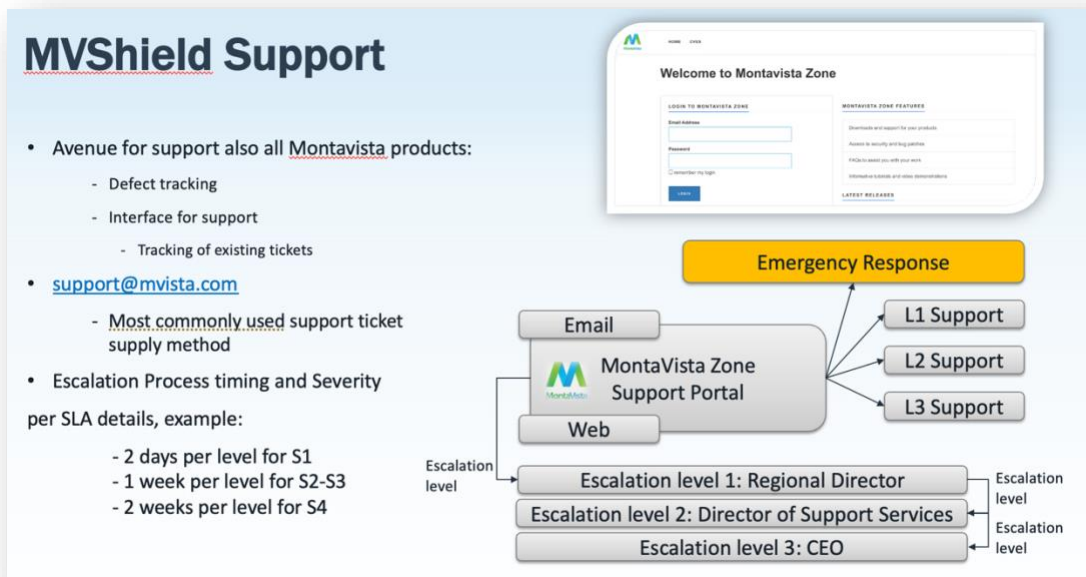
# Experience over the First Year of Deployment

Initially, the customer deployed the base platform and the regular updates, with support requests being limited to mostly usage- and alignment-type tickets while the system was being setup with Proof-of-concept (PoC) deployments first at several end customers.

At one point, the customer started experiencing crashes at their deployment that was extremely difficult to diagnose. This created customer satisfaction questions for them at a crucial phase of deployment.   To assist, the MVShield emergency response capability was triggered by the customer to triage the issues. While very hard to reproduce, the MontaVista Linux expert team worked in partnership with the customer engineers to pinpoint the issue using research, trace logs, core dumps and over 20 years of experience in handling Linux platform issues involving the kernel.  Over time, several core issues in the configuration of the platform real-time response settings were found to be causing the crashes.  MontaVista and the customer engineering teams worked collaboratively to identify the root cause and apply patches that either gathered more information or fixed the issue.

The customer openly appreciated that the involvement of the MontaVista experts in the process to track down the issues was critical, otherwise the deployment and the whole customer account would've been in jeopardy.

MontaVista takes pride in our work in never leaving the customer in trouble, since we know that when things do go wrong at the customers end deployment, that is when the real trustworthiness and value of an engineering partnership is weighted.

# Conclusion

Thank you for interest in our technology - this Tech Brief has aimed to give an overview of the steps required to deploy MVShield when a customer has an existing platform to migrate and gave some specific examples of the types of value delivered by MVShield.

Specifically, MVShield was found to be almost a drop-in replacement for the customer's existing CentOS platform, and the regular security updates as well as the advanced SLA support provided by MontaVista in the program significantly reduced the workload or risk experienced by the customer, while accelerating the time-to-resolution and the perceived expertise of the customer organization towards their end customer.

On the commercial side, the customer was very impressed on the amount of cost saved by using the MVShield solution and MontaVista's expert support, compared to other commercial Enterprise Linux solutions or using their own resources for maintenance.

We at MontaVista are very open to comments, questions, or suggestions for improvement for our material, and of course are extremely eager to hear about your projects where MVShield or other MontaVista products could be useful.

We invite all interested parties to visit www.mvista.com and/or contact us at sales@mvista.com or by any of the means listed below.

MontaVista Software, LLC, is a leader in embedded Linux commercialization. For over 20 years, MontaVista has been helping Linux developers get the most out of open source by adding commercial quality, integration, hardware enablement, expert support, and the expert resources of the MontaVista development community. Because MontaVista customers enjoy faster time-to-market, more competitive device functionality, and lower total cost, more devices have been deployed with MontaVista than with any other Linux.

For more information about MontaVista, visit http://www.mvista.com

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