

TUXERA

AGL Virtualization EG

File systems

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GENIVI AVPS - Automotive Virtual Platform Specification

- Focus on VIRTIO. Main benefit is very simple:
*“VIRTIO's main benefit for the automotive industry lies in it's **sheer existence and operating system support.**”*
- AVPS is the result of a thorough analysis of the different device types
- **Filesystems**
 - Did not identify a clear need in Embedded/Automotive applications
 - Short section around file systems - ”2.8.2 Filesystem virtualization”

GENIVI AVPS - VIRTIO - Filesystems

- Host-to-VM storage sharing

“The working group found **little need** for this host-to-vm disk sharing in the final product in most automotive systems [...]”

“[VIRTIO] mentions, very briefly, one network disk protocol for the purpose of hypervisor-to-vm storage sharing, which is **9pfs**.”

“9pfs is a **minimalistic network file-system protocol** that could be used for **simple HV-to-VM** exposure of file system, where **performance is not critical**.”

“9pfs has known **performance problems** however but running 9pfs over vsock could be an optimization option. 9pfs seems to **lack a flexible and reliable security model** [...]”

“We can envision something like **software update use-cases** that have the Hypervisor in charge of modifying the actual storage areas for code.”

GENIVI AVPS - VIRTIO - Filesystems

- VIRTIO-fs

“aims to “provide local file system semantics between multiple virtual machines sharing a directory tree”. It uses the **FUSE protocol over VIRTIO**, which means reusing a proven and stable interface and guarantees the expected **POSIX filesystem semantics** also when multiple VMs operate on the same file system.”

- VM-to-VM sharing

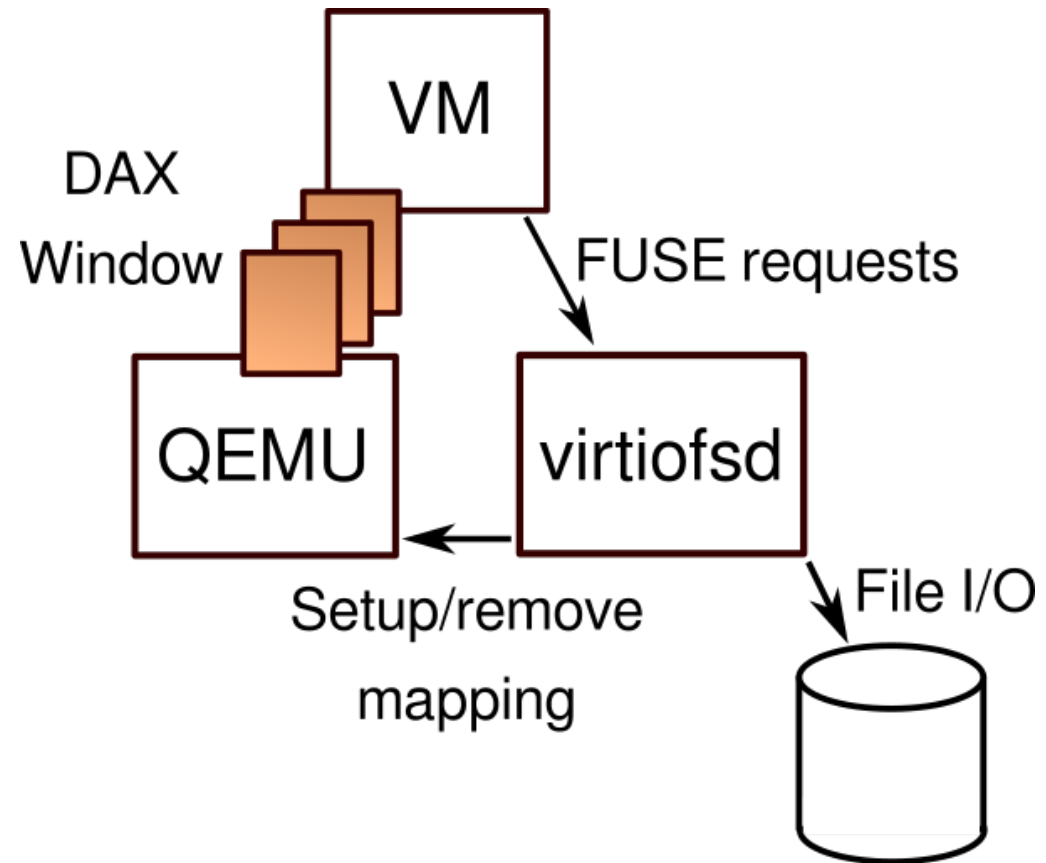
“**Optimizations** of VM-to-VM sharing will be possible by **using shared memory** as being defined in VIRTIO 1.2. File system operations on data that is cached in memory will then be very fast also between VMs.”

VIRTIO 1.2

- Specification should be frozen already by now. OpenSynergy to confirm actual status.
- virtio-spec / virtio-fs.tex
 - Last commit 29 August 2019

virtio-fs - Linux implementation

- Included in Linux from kernel 5.4
- Developed by RedHat
- [Design documentation](#)
- [FAQ](#)



References

- **GENIVI AVPS**

<https://at.projects.genivi.org/wiki/display/DIRO/Automotive+Virtual+Platform+Specification>

<https://at.projects.genivi.org/wiki/display/DIRO/Virtual+Platform+definition+for+Automotive+Hypervisor+Environments>

- **VIRTIO 1.2**

<https://github.com/oasis-tcs/virtio-spec/blob/master/virtio-fs.tex>

- **Virtio-fs**

<https://virtio-fs.gitlab.io/>

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