Reduce KVM guest memory footprint

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Dev Conf

04/08/2018

Goal?

- Fit more guests into system.

How to achieve this?

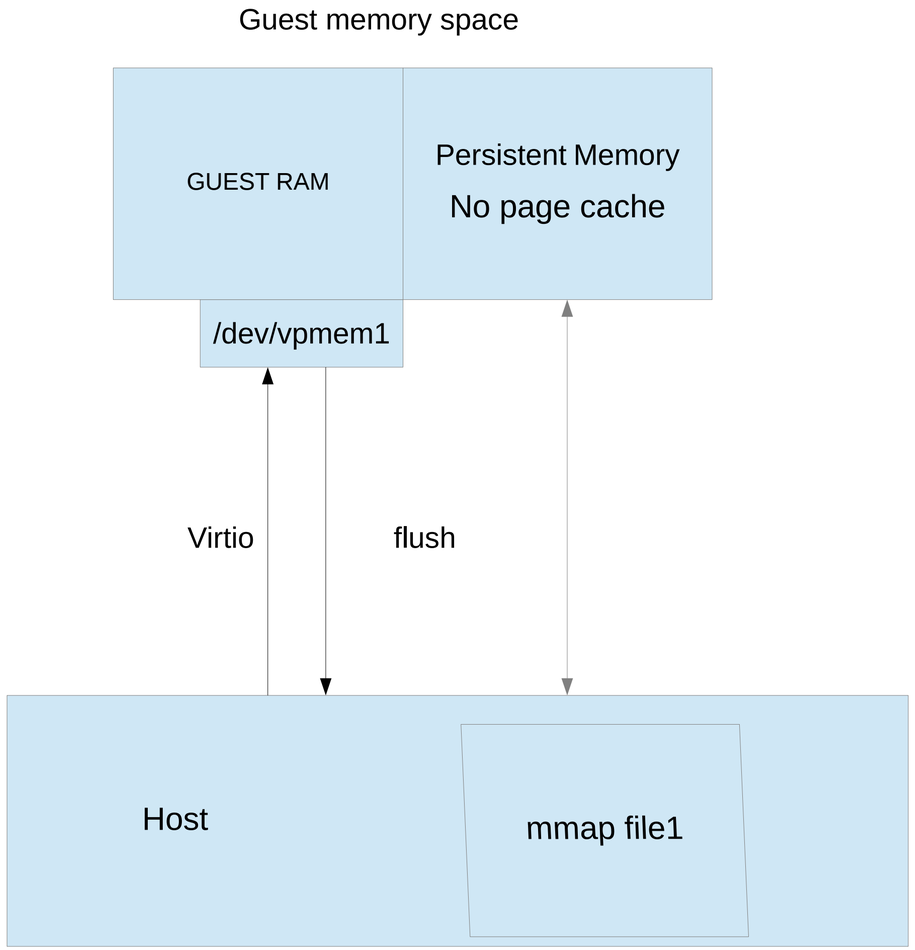
- Reduce guest memory footprint.
- Big part of guest memory is page cache.
- Avoid guest page cache.

Reduce guest memory footprint

- Free page hinting
- Eliminate guest page cache

Fake DAX flushing interface

- Memory mapping QEMU disk image to guest memory.
- Reuse DAX(Direct Access) file-system functions for guest file operations.
- Not using real NVDIMM(non volatile DIMM), so need flushing interface.



Fake DAX flushing interface?

- Data written into host page cache through fake NVDIMM device.
- Qemu virtio-pmem device.
- Virtio-pmem driver for guest.
- Way to tell host to do a fsync to persist guest changes.

Virtio-pmem driver

- Reads persistent memory range from paravirt device and reserves system memory map.

- It also allocates a block device corresponding to pmem range which is accessed by DAX capable file systems.

References

- Upstream RFC patch series

  https://lkml.org/lkml/2018/7/13/102

- Questions?