Global VA

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What is Global VA?

- **Single Registration:**
  - Registers the entire virtual address space once, eliminating the need for individual memory buffer registrations.

- **Transport-Specific:**
  - Particularly beneficial for InfiniBand, leveraging its advanced memory management features.

- **Dynamic Memory Access:**
  - After initial registration, RDMA operations can access any part of the process's memory without additional steps or application involvement.

- **Simplified Memory Management:**
  - Reduces complexity in managing memory for RDMA operations, enhancing scalability.

Implementation details

- When registering region with GVA support
  - Pin memory with mlock() system call.
  - If transport have GVA support:
    - Use singleton GVA memory key
      - In case of infiniband use Implicit On-Demand Paging (ODP) which dynamically handles memory page faults.
    - Populating device translation tables with uct_md_mem_advise(UCT_MADV_WILLNEED) to reducing latency during RDMA operations.

Thanks