

- **RASHPA: RDMA-based Acquisition System for High Performance Application**
- Implementation of a DAQ **framework** for 2D X-ray detectors:
 - . Adapted to very high data rates produced by recent X-ray detectors (1 to 100 Gbytes)
 - . Suitable for diversity of new high performance detectors
 - . Sufficiently generic and scalable
 - . Promoting standardisation and reusability

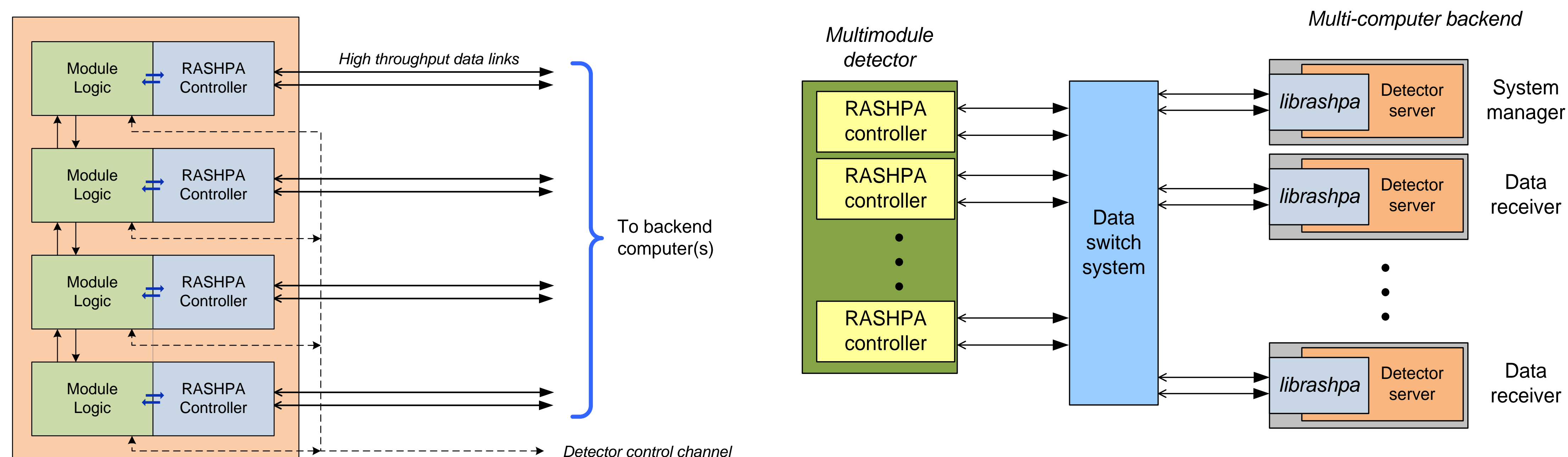
Motivations

- Current and upcoming advanced detectors produce very high data throughput.
- Industrial DAQ protocols do not handle the required data throughput
- The need for a sufficiently generic and scalable standard tool
- Reusable in a wide range of high performance detectors



Features

- Multiple destinations
- Zero copy RDMA transfer
- Simultaneous data flows
- Image data manipulation



XML telegrams

UTF-8 encoded XML data blocks used for:

- Capability retrieval of DMs & DRs
- Passing capabilities to librashpa
- Configuration of DRs and DMs via librashpa is the SM

```
<rashpa version="1.0">
  <module_config>
    <module name="my_name">
      <dchan index="0"> ... </dchan>
      <dchan index="3"> ... </dchan>
      ....
      <dchan index="1"> ... </dchan>
    </module>
  </module_config>
</rashpa>
```

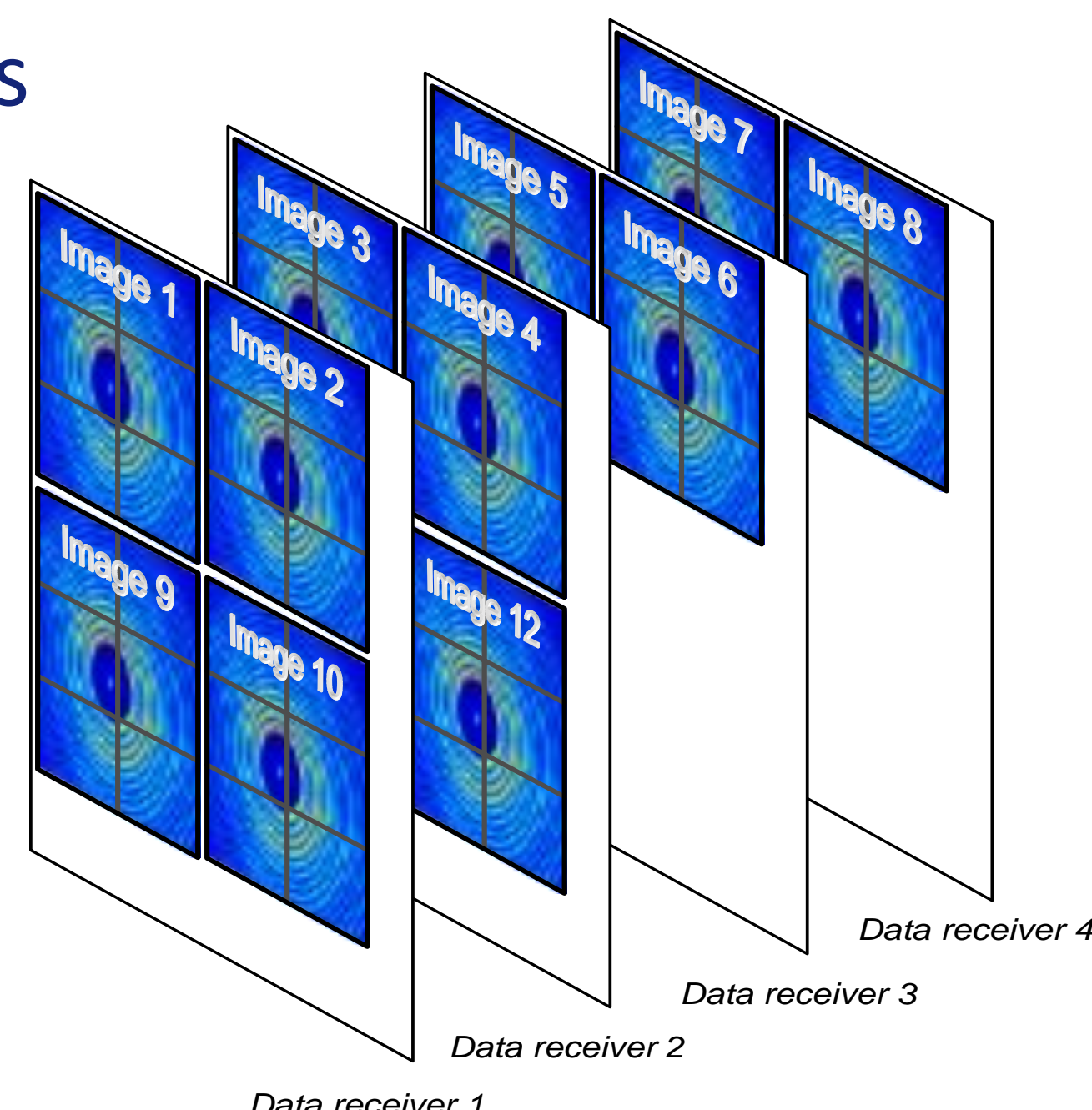
Rashpa Address Space (RAS)

- Single common space that remaps all memory areas of the DRs.
- Appears as continuous block for the RC.
- Constructed by librashpa in the DRs.
- Consisting of sets of address areas or blocks residing in one or more DR called *Rashpa buffers*.

Data Transfer Process (DTP)

Capability retrieval of DMs & DRs

- A direct transfer of data from DM to one rashpa buffer in the DR
- Example of DTP from 2D detector composed by six independent modules to a 4-computer RASHPA buffer



Rashpa channels

- Data channels: are functional blocks of RC that are in charge of data transfer.
- At least one active data channel per RC.
- Event Channel: asynchronous messages generated by librashpa in the DRs used to signal the detector application about errors, changes of status or data transfer running progress.