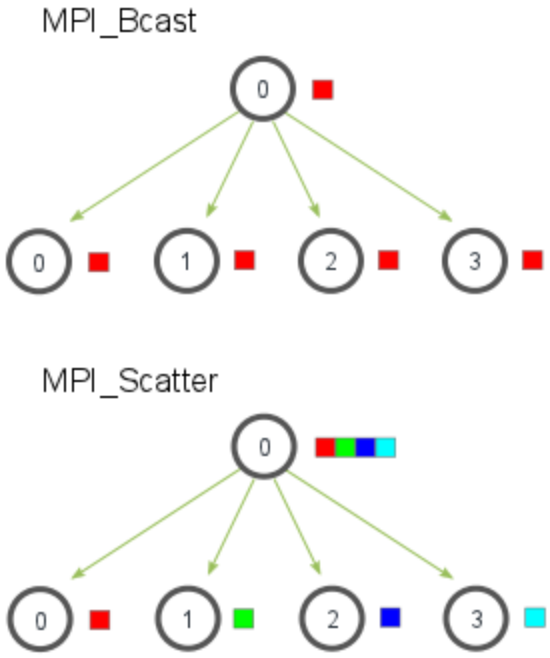
MPI Scatter and Gather

MPI Scatter

- MPI_Scatter involves a designated root process sending data to all processes in a communicator.
- The primary difference between MPI_Bcast and MPI_Scatter is small but important.
- MPI_Bcast sends the *same* piece of data to all processes while MPI_Scatter sends *chunks of an array* to different processes.

MPI_Scatter



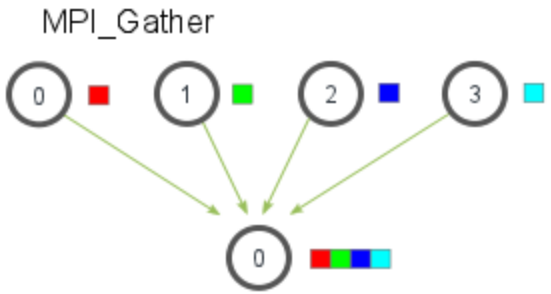
MPI Scatter

```
MPI_Scatter(
        void* send_data,
        int send_count,
        MPI_Datatype send_datatype,
        void* recv_data,
        int recv_count,
        MPI_Datatype recv_datatype,
        int root,
        MPI_Comm communicator
)
```

MPI_Gather

- MPI_Gather is the inverse of MPI_Scatter.
- Instead of spreading elements from one process to many processes, MPI_Gather takes elements from many processes and gathers them to one single process.
- This routine is highly useful to many parallel algorithms, such as parallel sorting and searching.

MPI_Gather



```
MPI_Gather(
        void* send_data,
        int send_count,
        MPI_Datatype send_datatype,
        void* recv_data,
        int recv_count,
        MPI_Datatype recv_datatype,
        int root,
        MPI_Comm communicator
)
```