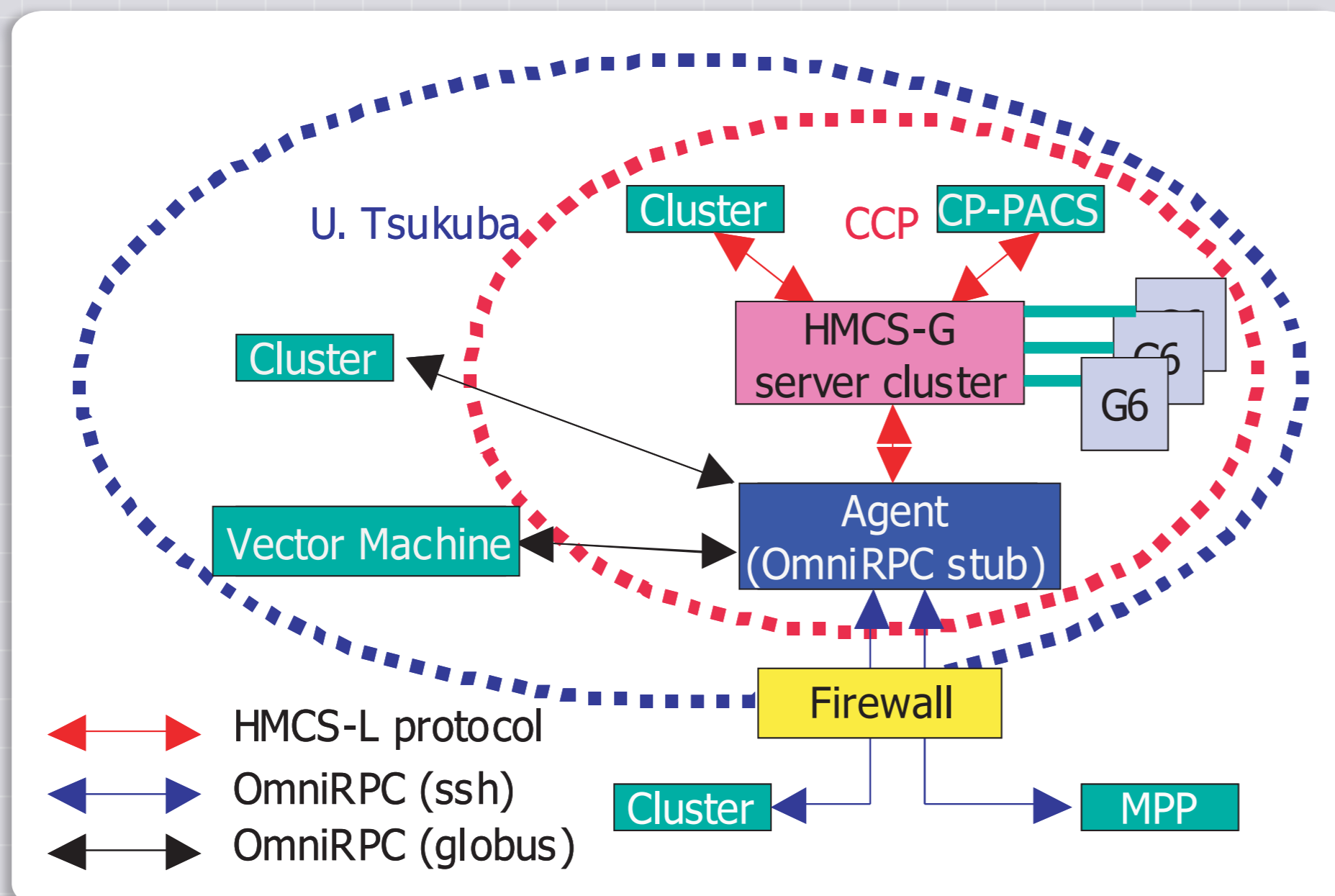




# HMCS-G

## Grid-enabled HMCS

### Conceptual Block Diagram of HMCS-G



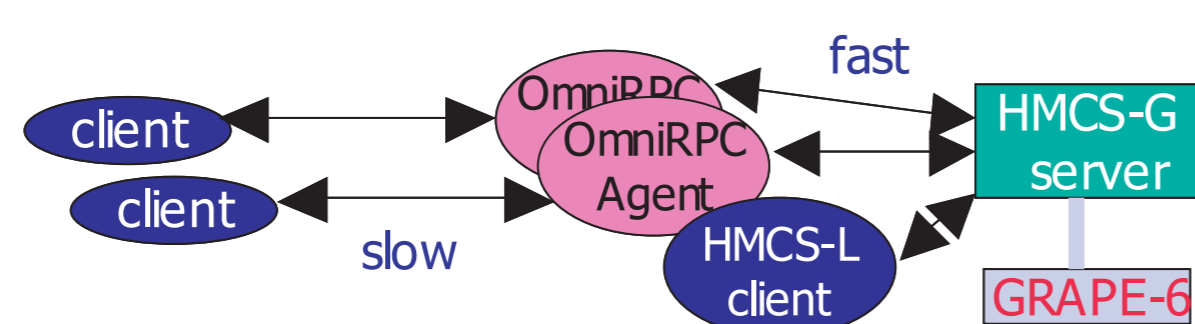
HMCS-G is a gravity calculation service system centering HMCS server of GRAPE-6 gravity engine with Grid RPC which enables world-wide access to GRAPE-6 system.

Hybrid computation with gravity calculation (particle system) and other physical phenomena such as hydrodynamics (continuum system) are simultaneously simulated by GRAPE-6 server and client machines, respectively.

OmniRPC is used to enable easy access from any system outside of CCP through either ssh or globus authentication.

GRAPE-6 system is shared by multiple remote clients with high efficiency not depending on network bandwidth nor latency of each client.

### OmniRPC Agent in HMCS-G



OmniRPC Agent works as communication buffer to absorb the speed-gap between WAN and LAN.

### API for HMCS-G Client

- ▶ `gg6_init(char *agent, int key)`  
/\* initialize & specify agent \*/
- ▶ `gg6_start(int nio, int mode)`  
/\* specify # of nodes, utilization mode \*/
- ▶ `gg6_unit(int np, int unit_t, int unit_x)`  
/\* specify # of particles and magnitude \*/
- ▶ `gg6_calc1(double mass[], double x[][3], double f_old[], double phiold[])`  
/\* request actual calculation \*/
- ▶ `gg6_wait1(double acc[][3], double f[])`  
/\* retrieve calculation result \*/
- ▶ `gg6_end()`  
/\* End of calculation \*/

### Service Time of HMCS-G

