Instructions to run 34 Node from 7 Node DGI code:

DGI Application Integration:

Step 1: 7 Node model has 3 slaves whereas 34 Node system needs 6 slaves.

Make 3 copies of any one slave from 7 Node (donot make copy of the master)

Step 2: Find the freedm.cfg file in each DGI node and add additional port number on all the DGI nodes (master + 6 slaves) for the new slaves created

below is an example for master do the same for all 6 slaves with port numbers 5002 to 5007

**add-host=arrogate:5002**

**add-host=arrogate:5003**

**add-host=arrogate:5004**

**add-host=arrogate:5005**

**add-host=arrogate:5006**

**add-host=arrogate:5007**

**address=0.0.0.0**

**port=5001**

Step 3: In the freedm.cfg disable the adapter on all the DGI nodes by adding a ‘#’ in the front as shown below

**#** **adapter-config=config/adapter.xml** => **adapter-config=config/adapter.xml**

Step 4: go to /root/VoltVar-DGI2.0-HIL\_34\_yue/Broker/src/VoltVar.cpp and make following changes

I. Comment out the entire read from RSCAD section. The Pload values will be used from the loadsystem.cpp file (which is the default Pload value)

II. In send message to slave section change the following:

from:

S2 << Dl(1,7) << Dl(2,7) << Dl(3,7) << Dl(4,7) << Dl(6,7) << Dl(7,7) << Dl(8,7) << Dl(1,9) << Dl(2,9) << Dl(3,9) << Dl(4,9) << Dl(6,9) << Dl(7,9) << Dl(8,9) << Dl(1,11)<< Dl(2,11)<< Dl(3,11)<< Dl(4,11)<< Dl(6,11)<< Dl(7,11)<< Dl(8,11)<< endr;

To:

S2 << Dl(9,7) << Dl(13,7) << Dl(14,7) << Dl(15,7) << Dl(16,7) << Dl(23,7) << Dl(24,7) << Dl(31,7) << Dl(33,7) << Dl(36,7) << Dl (38,7) << Dl(40,7) << Dl(1,9) << Dl(7,9) << Dl(9,9) << Dl(13,9) << Dl(14,9) << Dl(15,9) << Dl(16,9) << Dl(18,9) << Dl(20,9) << Dl(26,9) << Dl(28,9) << Dl(31,9) << Dl(36,9) << Dl(37,9) << Dl(38,9) << Dl(40,9) << Dl(1,11) << Dl(8,11) << Dl(9,11) << Dl(13,11) << Dl(14,11) << Dl(15,11) << Dl(16,11) << Dl(31,11) << Dl(36,11) << Dl(37,11) << Dl(38,11) << Dl(40,11) << endr;

Note: Here S2 is the vector of all the Qinj phase wise (a,b & c) for all the slaves put together and broadcast to the slaves. The slaves are then configured to extract the appropriate Qinj form the S2 vector.

Step 5: go to individual slaves and configure the appropriate gradients to be used for each phase in the slaves

example in Slave 1:

//sstA\_cmd = mean(mean(Grad\_slave1.rows(1,3)));

//sstB\_cmd = mean(mean(Grad\_slave1.rows(8,10)));

//sstC\_cmd = mean(mean(Grad\_slave1.rows(15,17)));

sstA\_cmd = 0; //No Phase A loads in Area 1

sstB\_cmd = mean(mean(join\_cols(Grad\_slave1.row(12),Grad\_slave1.row(20))));

sstC\_cmd = mean(mean(Grad\_slave1.row(28)));

Note: sstA\_cmd is the average of all Qinj for phase – A in the corresponding Area/Slave. The sstA\_cmd will then be sent to all the SST’s in the area or under the slave. Similarly sstB\_cmd & sstC\_cmd

In Slave 2:

//std::cout << Grad\_slave1 << std::endl;

//sstA\_cmd = mean(mean(Grad\_slave1.row(0)));

//sstB\_cmd = mean(mean(Grad\_slave1.row(7)));

//sstC\_cmd = mean(mean(Grad\_slave1.row(14)));

sstA\_cmd = mean(mean(Grad\_slave1.rows(5,6)));

sstB\_cmd = 0; //No Phase B loads in Area 2

sstC\_cmd = 0; //No Phase C loads in Area 3

In Slave 3:

//sstA\_cmd = mean(mean(Grad\_slave1.rows(4,6)));

//sstB\_cmd = mean(mean(Grad\_slave1.rows(11,13)));

//sstC\_cmd = mean(mean(Grad\_slave1.rows(18,20)));

sstA\_cmd = 0;

sstB\_cmd = mean(mean(join\_cols(Grad\_slave1.row(13),Grad\_slave1.row(21))));

sstC\_cmd = 0;

In Slave 4:

//sstA\_cmd = mean(mean(Grad\_slave1.rows(1,3)));

//sstB\_cmd = mean(mean(Grad\_slave1.rows(8,10)));

//sstC\_cmd = mean(mean(Grad\_slave1.rows(15,17)));

sstA\_cmd = mean(mean(Grad\_slave1.row(0)));

sstB\_cmd = mean(mean(join\_cols(Grad\_slave1.row(14),Grad\_slave1.row(22))));

sstC\_cmd = mean(mean(join\_cols(Grad\_slave1.row(29),Grad\_slave1.row(30))));

In Slave 5:

//sstA\_cmd = mean(mean(Grad\_slave1.rows(1,3)));

//sstB\_cmd = mean(mean(Grad\_slave1.rows(8,10)));

//sstC\_cmd = mean(mean(Grad\_slave1.rows(15,17)));

sstA\_cmd = mean(mean(join\_cols(Grad\_slave1.row(1),Grad\_slave1.rows(7,8))));

sstB\_cmd = mean(mean(join\_cols(Grad\_slave1.row(15),Grad\_slave1.row(23))));

sstC\_cmd = mean(mean(join\_cols(Grad\_slave1.row(31),Grad\_slave1.row(35))));

In Slave 6:

//sstA\_cmd = mean(mean(Grad\_slave1.rows(1,3)));

//sstB\_cmd = mean(mean(Grad\_slave1.rows(8,10)));

//sstC\_cmd = mean(mean(Grad\_slave1.rows(15,17)));

sstA\_cmd = mean(mean(join\_cols(Grad\_slave1.rows(2,4),Grad\_slave1.rows(9,11))));

sstB\_cmd = mean(mean(join\_cols(Grad\_slave1.rows(16,19),Grad\_slave1.rows(24,27))));

sstC\_cmd = mean(mean(join\_cols(Grad\_slave1.rows(32,34),Grad\_slave1.rows(36,39))));