```
PGXCNodeHandle/pgxc_node_handle {
                      Oid nodeoid;
                                                                                                                                                                                                                                                                       BulkloadCopyFrom()
                      /* fd of the connection */
                      int sock:
                                                                                                                                                                                                                                                                         if (copyStatement->file == NULL && IsBinaryCopy())
                      /* Connection state */
                                                                                                                                                                                                                         if (IsBulkloadCopy(copyStatement))
                      char transaction status:
                                                                                                                                                                                                                                                                            elog(ERROR, "Bulkload copy is not supported for copy from stdin with binary format");
                      DNConnectionState state;
                                                                                                                                                                                                                          /* Citus br_bulkload BulkloadCopyServer() */
                      bool read only:
                                                                                                                                                                                                                                                                         /* inspired from BulkloadCopyServer() of Citus bulkload copy */
                                                                                                                                                                                                                          BulkloadCopyFrom()
                      struct ResponseCombiner *combiner;
                                                                                                                                                                                                                                                                         List *coordNodes = CoordinatorLists();
                     #ifdef DN_CONNECTION_DEBUG
                                                                                                                                                                                                                                                                         NodeAddress *serverAddress = LocalAddress();
                                                                                                                                                                                                                        else
                      bool have_row_desc;
                                                                                                                                                                                                                                                                         ConstructBulkloadCopyStmt();
                     #endif
                                                                                                                                                                                                                                                                         foreach (coordinator)
                                                                                                                                                                                                                           BeginCopyFrom()
                      char *error:
                                                                                                                                                                                                                          CopyFrom()
                      /* Output buffer */
                                                                                                                                                                                                                                                                           ConnectToNode()
                                                                                                                                                                                                                           EndCopyFrom()
                      char *outBuffer;
                                                                                                                                                                                                                                                                           SendCopyStmt()
                      size t outSize:
                      size_t outEnd;
                                                                                                                                                                                                                                                                         StartZeroMQServer()
                      /* Input buffer */
                                                                                                                                                                                                                                                                         StopZeroMQServer()
                      char *inBuffer:
                      size_t inSize;
                                                                                                                                                                                                                                                              ProcessCopyOptions()
                     size_t inStart;
                                                                                                                                                                                                                                                              RemoteCopy_GetRelationLoc()
                      size_t inEnd;
                                                                                                                                                                                                                                                              获取表的location信息
                      size_t inCursor;
                                                                                                                                                                                                                                                              RemoteCopy_BuildStatement()
                       * Have a variable to enable/disable response checking and
                                                                                                                                                                                                                                                              构建COPY命令
                       * if enable then read the result of response checking
                                                                                                                                                                                                                                                                                                get_anyhandler()/get_handlers()
                       * For details see comments of RESP_ROLLBACK
                                                                                                                                                                                                                                                                                                                      paxc node send axid()
                                                                                                                                                                                                                                             BeginCopy()
                                                                                                                                                                                                                                                                                                                       pgxc node send timestamp()
                      bool ck_resp_rollback;
                                                                                                                                                                                                                                                                                                pgxc_node_begin()
                                                                                                                                                                                                           DoCopy()
                                                                                                                                                                               standard_ProcessUtility()
                                                                                                                                        PortalRunUtility()
                                                                                                                                                            ProcessUtility()
                                                                                                                                                                                                                        BeginCopyFrom()
                                                                                主要结构体
                                                                                                                         ProtalRun()
                                                                                                exec_simple_query()
                                                                                                                                                                                                                                                                                                                                                          pgxc_node_flush()
                                                                                                                                                                                                                                                                                                                      pgxc_node_send_query("BEGIN")
                                                                                                                                                                                                                                                              DataNodeCopyBegin()
                                                                                                                                                                                                                                                              建立连接 并发送事务和COPY命令
                                                                                                                                                                                                                                                                                                                      pgxc_node_set_query()
PGXCNodeAllHandles {
PGXCNodeHandle *primary_handle; /* Primary connection to PGXC node */
                                                                                                                                                                                                                                                                                                createLocator()
int dn conn count; /* number of Datanode Handles including primary handle */
                                                                                                                                                                                                                                                                                                pgxc_node_send_snapshot()
PGXCNodeHandle **datanode handles: /* an array of Datanode handles */
int co conn count; /* number of Coordinator handles */
                                                                                                                                                                                                                                                                                                PGXCNodeHandle **coord handles; /* an array of Coordinator handles */
                                                                                                                                                                                                                                             OpenPipeStream()
                                                                                                                                                                                                                                             AllocateFile()
     Locator/_Locator {
                                                                                                                                                                                                                                             DataNodeCopyInBinaryForAII()
       * Determine target nodes for value.
                                                                                                                                                                                                                                        NextCopyFrom()
       * Resulting nodes are stored to the results array.
                                                                                                                                                                                                                                                                                              InitResponseCombiner()
       * Function returns number of node references written to the array.
                                                                                                                                                                                                                                                                                              handle_response()
      int (*locatefunc) (Locator *self, Datum value, bool isnull,
                                                                                                                                                                                                                                                                                              send some()
              bool *hasprimary);
                                                                                                                                                                                                                                                                                              pgxc node send XXX() 调用 pgxc node flush()
      // locatefunc 就是 locator.c 中的各种locate xxx() 函数
                                                                                                                                                                                                                        CopyFrom()
                                                                                                                                                                                                                                        DataNodeCopyIn(GET_NODES(), getLocatorResults())
                                                                                                                                                                                                                                                                                              而后者调用 send_some() 通过 socket 完成实际数据发送
      Oid dataType; /* values of that type are passed to locateNodes function */
                                                                                                                                                                                                                                        通过调用GET_NODES()获取要插入的DataNodes
      LocatorListType listType;
                                                                                                                                                                                                                                                                                                                                  locate_hash_insert() // for hash table
      bool primary;
                                                                                                                                                                                                                                                                                                                                 locate_static() //for replicate table
                                                                                                                                                                                                                                                                                              GET NODES()
      /* locator-specific data */
                                                                                                                                                                                                                                                                                              通过调用locate_xxx()计算目的节点
                                                                                                                                                                                                                                                                                                                                 locate_modulo_insert()
      /* XXX: move them into union ? */
      int roundRobinNode; /* for LOCATOR_TYPE_RROBIN */
                                                                                                                                                                                                                                                                                                                                 locate roundrobin()
      LocatorHashFunc hashfunc: /* for LOCATOR TYPE HASH */
                                                                                                                                                                                                                                                                                             pgxc_node_flush()
                                                                                                                                                                                                                                                                                                                   send_some()
                                                                                                                                                                                                                                                                     DataNodeCopyEnd()
                                                                                                                                                                                                                                            DataNodeCopyFinish()
      int valuelen; /* 1, 2 or 4 for LOCATOR_TYPE_MODULO */
                                                                                                                                                                                                                        EndCopyFrom()
                                                                                                                                                                                                                                                                       freeLocator()
                                                                                                                                                                                                                                            FreeRemoteCopyData()
      int nodeCount; /* How many nodes are in the map */
                                                                                                                                                                                                                                                                      FreeRelationLocInfo()
       void *nodeMap; /* map index to node reference according to listType */
       void *results; /* array to output results */
```