### CODE EXAMPLE-3 FOR PCYNLITX

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Example for wait("Function\_Name") member function

### 1 BASIC DEFINITIONS

If you read before the definitions given in below, you can skip this page and look the example directly. In this document, the execution of the program is shown step by step in the slayt form. In order to do that, some basic definitions are given in below.

# 1.1 Thread Server:

For each applications, a server class that is responsible for the management of the threads is produced automatically by the Pcynlitx platform. If the programmer does not determine a name for that class, Pcynlitx set the name of this class as "Thread\_Server". The instance of that class creates the threads and it is named as "Server" in the following examples. In each thread creation, the address of the server object is automatically passed to the each thread by means of a thread-specific data structure ( thds ). This data structure has been explained in below. Therefore, the server object is a container for every object that is shared between the threads. Each member of the server object is automatically reachable on the thread scopes. For more information, please read the tutorial.

## 1.2 TM Client:

TM\_Client is a special class and an instance of that class must be used on each function routines executed by the threads. The instance of the TM\_Client class, which is named as "Manager" in the following examples, makes indirection to the object which is responsible from thread synchronization.

### 1.3 Namespace declaration

In pcynlitx platform, you can determine the namespace of the library constructed by the pcynlitx platform. If you does not enter any name to the namespace section to the platform before the library construction process, the default name which is "pcynlitx" is setted.

#### 1.4 thds data structure:

The data structure that is named as "thds" holds the addresses of the variables which are shared between the threads. It is ab abbrevation for the term thread-specific data structure using in order to indicate the information that is passed only a certain thread.

```
void thread_function_1(pcynlitx::thds * arg){
                                                                               void thread_function_2(pcynlitx::thds * arg){
                                                                                    pcynlitx::TM_Client Manager(arg,"thread_function_2");
     pcynlitx::TM_Client Manager(arg,"thread_function_1");
     // Code segment
                                                                                    // Code segment
     Manager.wait("thread_function_1");
                                                                                    Manager.wait("thread_function_2",0);
     // Code segment
                                                                                    // Code segment
                                   This function blocks all af the
                                                                                                                    all af the threads executing
                                                                                    Manager.Exit();
                                   threads executing "thread_function_1"
                                                                                                                    "thread function 2" waits in here
                                   until all of the threads executing
                                                                                                                    until thread[0] perform function
                                   "thread_function_1" calls of it.
                                                                                                                    call rescue("thread function 2",0).
     Manager.rescue("thread_function_2",0);
     Manager.Exit();
}
int main(int argc, char ** argv){
                                                         When the thread [0] call This function,
                                                         all af the threads executing
    pcynlitx::Thread_Server Server;
                                                         "thread_function_2" are rescued.
    for(int i=0;i<2;i++){</pre>
        Server.Activate(i,thread_function_1);
    }
    for(int i=2;i<4;i++){</pre>
       Server.Activate(i,thread_function_2);
    }
    for(int i=0;i<4;i++){</pre>
                             // In here, all of the threads are joined.
        Server.Join(i);
    };
    std::cout << "\n\ The end of the program .. \n";
    return 0;
```

Figure 1: STEP-1

```
void thread_function_2(pcynlitx::thds * arg){
void thread_function_1(pcynlitx::thds * arg){
                                                                        pcynlitx::TM_Client Manager(arg,"thread_function_2");
     pcynlitx::TM_Client Manager(arg,"thread_function_1");
                                                                        // Code segment
     // Code segment
                                                                        Manager.wait("thread_function_2",0);
     Manager.wait("thread_function_1");
                                    Thread [0] waits here
                                                                        // Code segment
     // Code segment
                                                                                             Thread [2] and Thread [3]
                                    untill Thread [1] reach.
                                                                                             wait in here.
                                                                        Manager.Exit();
     Manager.rescue("thread_function_2",0);
     Manager.Exit();
}
int main(int argc, char ** argv){
     pcynlitx::Thread_Server Server;
                                                 Thread [0]
     for(int i=0;i<2;i++){</pre>
         Server.Activate(i,thread_function_1);
     }
                                                 Thread [1] is on the way .
                                                 Thread [2]
     for(int i=2;i<4;i++){</pre>
         Server.Activate(i,thread_function_2);
     }
                                                 Thread [3]
     for(int i=0;i<4;i++){</pre>
                               // In here, all of the threads are joined.
          Server.Join(i);
     };
     std::cout << "\n\n The end of the program .. \n";</pre>
     return 0;
}
```

Figure 2: STEP-2

```
void thread_function_2(pcynlitx::thds * arg){
void thread_function_1(pcynlitx::thds * arg){
     pcynlitx::TM_Client Manager(arg,"thread_function_1");
                                                                       pcynlitx::TM_Client Manager(arg,"thread_function_2");
                                                                       // Code segment
     // Code segment
                                                                       Manager.wait("thread_function_2",0);
     Manager.wait("thread_function_1");
                                                                                          Thread [2] and Thread [3]
                             Thread [1] reached
                                                                       // Code segment
       // Code segment
                                                                                          wait here.
                             here Thread [0] is free.
                                                                       Manager.Exit();
                                                                  }
     Manager.rescue("thread_function_2",0);
     Manager.Exit();
}
int main(int argc, char ** argv){
     pcynlitx::Thread_Server Server;
                                               Thread [0]
     for(int i=0;i<2;i++){</pre>
          Server.Activate(i,thread_function_1);
                                                 Thread [1]
                                                 Thread [2]
     for(int i=2;i<4;i++){</pre>
          Server.Activate(i,thread_function_2);
     }
                                                 Thread [3]
     for(int i=0;i<4;i++){</pre>
                                // In here, all of the threads are joined.
          Server.Join(i);
    };
     std::cout << "\n\ The end of the program .. \n";
     return 0;
}
```

Figure 3: STEP-3

```
void thread_function_1(pcynlitx::thds * arg){
                                                                      void thread_function_2(pcynlitx::thds * arg){
     pcynlitx::TM_Client Manager(arg,"thread_function_1");
                                                                           pcynlitx::TM_Client Manager(arg,"thread_function_2");
     // Code segment
                                                                           // Code segment
     Manager.wait("thread_function_1");
                                                                           Manager.wait("thread_function_2",0);
     // Code segment
                                                                           // Code segment
                                                                                                       Now, Thread [2] and
                                                                                                       Thread [3] are free.
     Manager.rescue("thread_function_2",0);
                                                                           Manager.Exit();
                                                                      }
                                  Thread [0] calls the
     Manager.Exit();
}
                                  rescue function for the
                                  threads executing
int main(int argc, char ** argv){ "thread_function_2"
     pcynlitx::Thread_Server Server;
                                               Thread [0]
     for(int i=0;i<2;i++){</pre>
          Server.Activate(i,thread_function_1);
     }
                                                   Thread [1]
     for(int i=2;i<4;i++){</pre>
                                                   Thread [2]
          Server.Activate(i,thread_function_2);
     }
                                                   Thread [3]
     for(int i=0;i<4;i++){</pre>
          Server.Join(i);
                               // In here, all of the threads are joined.
     };
     std::cout << "\n\n The end of the program .. \n";</pre>
     return 0;
```

Figure 4: STEP-4

}

```
void thread_function_2 ( pcynlitx::thds * arg){
void thread_function_1(pcynlitx::thds * arg){
    pcynlitx::TM_Client Manager(arg,"thread_function_1");
                                                                        pcynlitx::TM_Client Manager(arg,"thread_function_2");
                                                                        // Code segment
    // Code segment
     Manager.wait("thread_function_1");
                                                                        Manager.wait("thread_function_2",0);
    // Code segment
                                                                        // Code segment
    Manager.rescue("thread_function_2",0);
                                                                        Manager.Exit();
    Manager.Exit();
                                                                     Each thread complates its execution.
int main(int argc, char ** argv){
    pcynlitx::Thread_Server Server;
                                               Thread [0]
    for(int i=0;i<2;i++){</pre>
        Server.Activate(i,thread_function_1);
                                              Thread [1]
   }
                                              Thread [2]
    for(int i=2;i<4;i++){</pre>
        Server.Activate(i,thread_function_2);
                                              Thread [3]
   }
    for(int i=0;i<4;i++){</pre>
        Server.Join(i);
                           // In here, all of the threads are joined.
   };
    std::cout << "\n\n The end of the program .. \n";</pre>
    return 0;
}
```

Figure 5: STEP-4