OPEN COMPONENTS FOR EMBEDDED REAL-TIME APPLICATIONS

ORTE - OCERA Real Time Ethernet

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Goals:

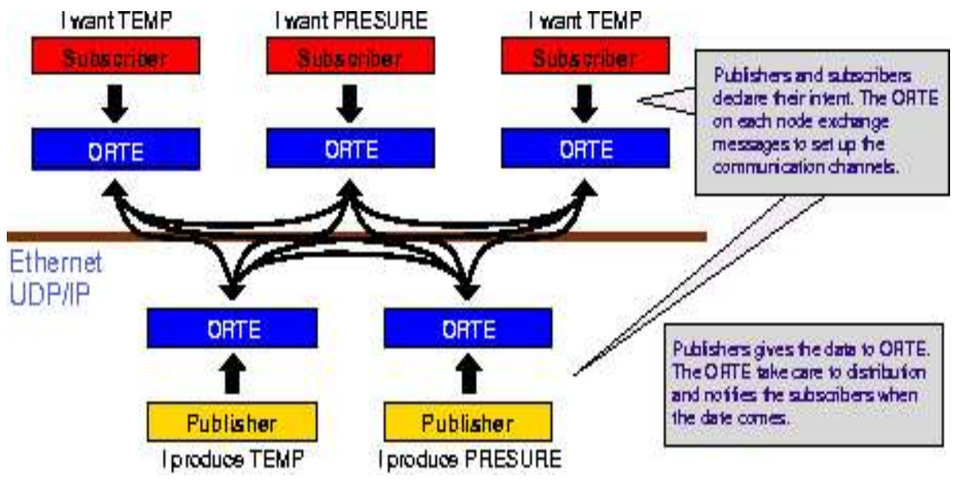
The goal of this demo is to show on simple example with objects, basic properties of real-time publish-subscribe (RTPS) architecture. The shape demo is used for creating wide RTPS networks, which globally transfers big amount of data.

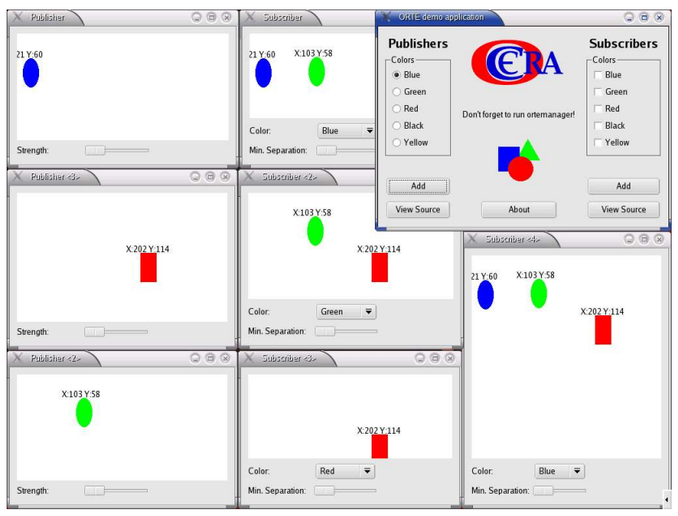
Tested components:

- ORTE (WP07)
- RTL components (WP05)
  - UDP, thread, semaphore, dymem

Description:

The ORTE implements the RTPS communications model, which is designed especially for embedded systems. It **runs on the top** of a standard **Internet UDP/IP protocol** stack.
Publish-subscribe middle ware presents a simple application programming interface (API) to the publisher and subscriber tasks and **takes care of the low-level network communication chores**: addressing, packet building, and message transfer.
Publishers and subscribers label each publication that will be distributed using a topic (name) rather than the node addresses.





The **ORTE is implemented as a set of objects** and they are of the following types:

- **Manager:** Special object that facilitates the automatic discovery of other Managers.
- **ManagedApplication:** An application that is managed by one or more Managers.
- **Writers (Publication, CSTWriter):** provide locally available data on the network.
- **Readers (Subscription, CSTReader):** obtain information provided by Writers.

As an **ORTE demonstration** the application **Shape Demo** has been developed. The application takes advantage of QT and ORTE libraries.

The Shape Demo main panel is divided in two parts:

- **Publishers** – user can chose colours, shapes and RTPS parameters to be published.
- **Subscribers** – user can chose the same properties to be subscribed.

Supported platforms: Linux, RTLinux, Windows 2000/XP

Demo phases

Phase 1

Compile library and executables files. The ORTE library is based on autoconf subsystem. It offers compatibility with many targets.

- ORTE library installation:

```
./configure; make;make install
```

- The Shape Demo (needs installed QT Library) -> go to directory orte/contrib/shape and type:

```
qmake; make
```

Phase 2

The ORTE manager is product of ORTE library. On each node, where the shape demo is running, it is necessary to run one instance of ORTE manager.

- OTE manager example:

```
ortemanager --peer 192.168.0.1:neptun:pluto:192.168.0.2 -e
```

Phase 3

run shape demo

- change parameter of publishers and subscribers

Conclusions and results:

The ORTE, an open source implementation of RTPS communication protocol, has been developed in this part of the WP7 component. The Shape Demo provides testing tool to inspect correct behaviour of the ORTE library. The best effort messages are used for communication with different applications, which presents non reliable type of messages.