



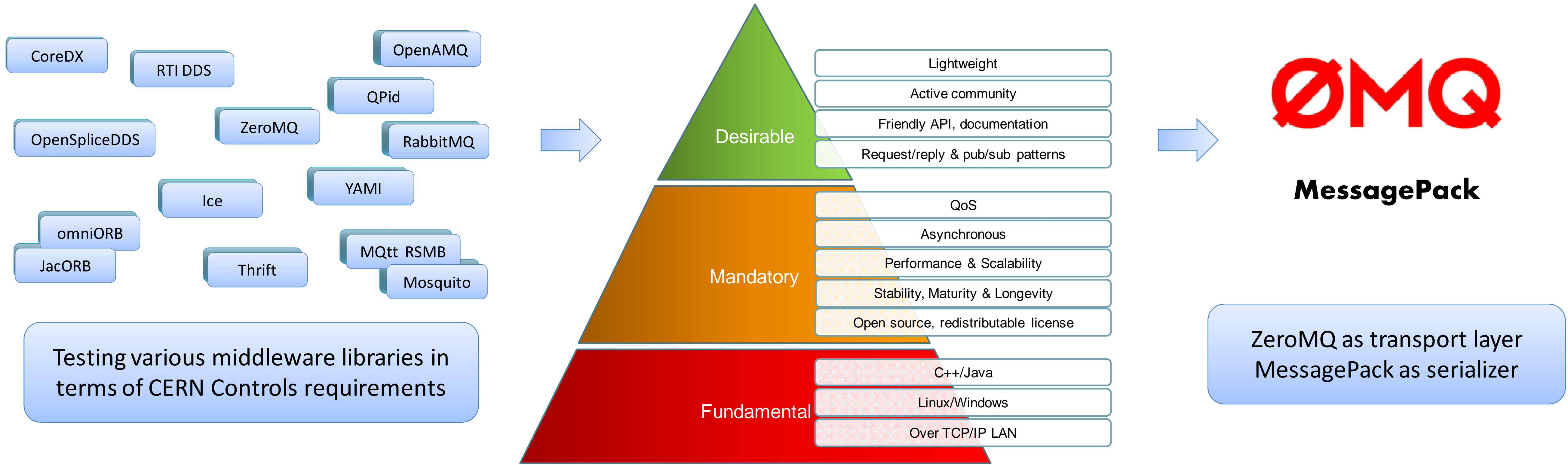
The new CERN Controls Middleware

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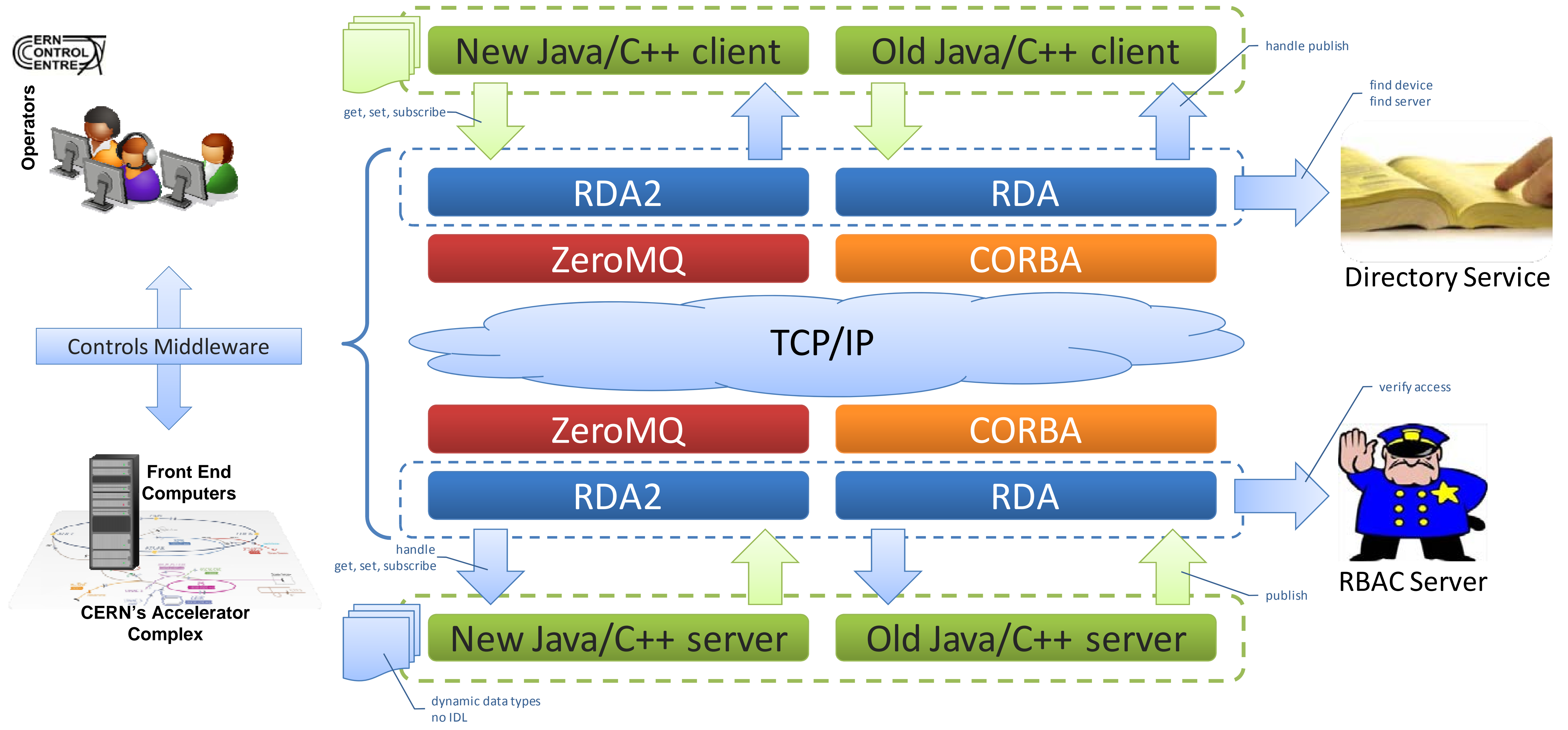
Introduction

The Controls Middleware (CMW) project was launched over ten years ago. Its main goal was to unify middleware solutions used to operate CERN accelerator complex. A key part of the project, the equipment access library RDA, was based on CORBA, an unquestionable middleware standard at the time. RDA became an operational and critical part of the infrastructure, yet the demanding run-time environment revealed shortcomings of the system. Accumulation of fixes and workarounds led to unnecessary complexity. RDA became difficult to maintain and to extend. CORBA proved to be rather a cumbersome product than a panacea. Fortunately, many new transport frameworks appeared since then. They boasted a better design and supported concepts that made them easier to use. Willing to profit from the coming long LHC shutdown which will make it possible to update the operational software, the CMW team reviewed user requirements and in their terms investigated eventual CORBA substitutes. Evaluation of several market recognized products helped to identify the most-suitable middleware solution: ZeroMQ. This poster presents the results of the evaluation process, the proposed design and functionality of the new system as well as the plan of its integration with the currently deployed system.

Middleware evaluation

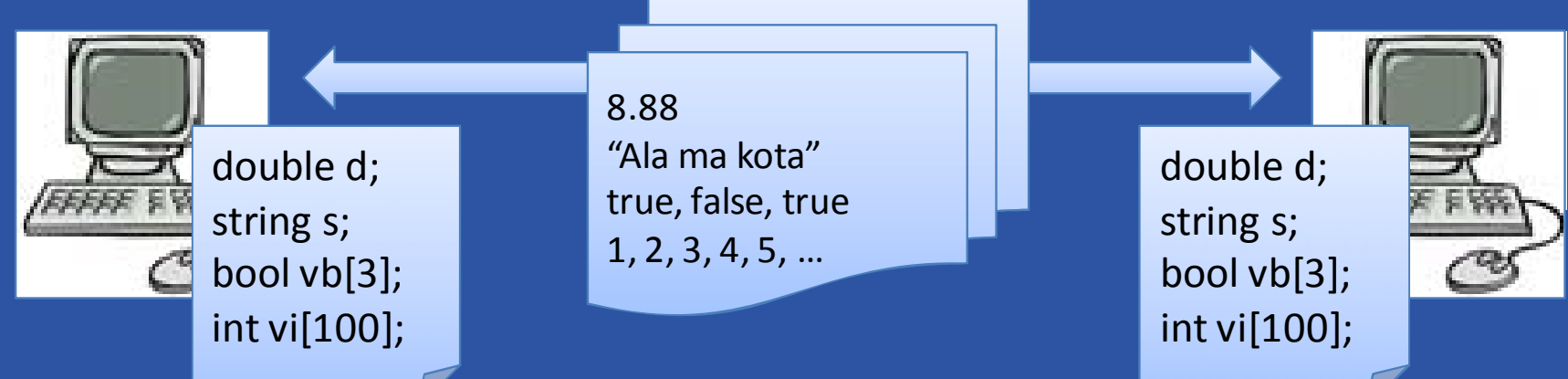


Remote Device Access (RDA)



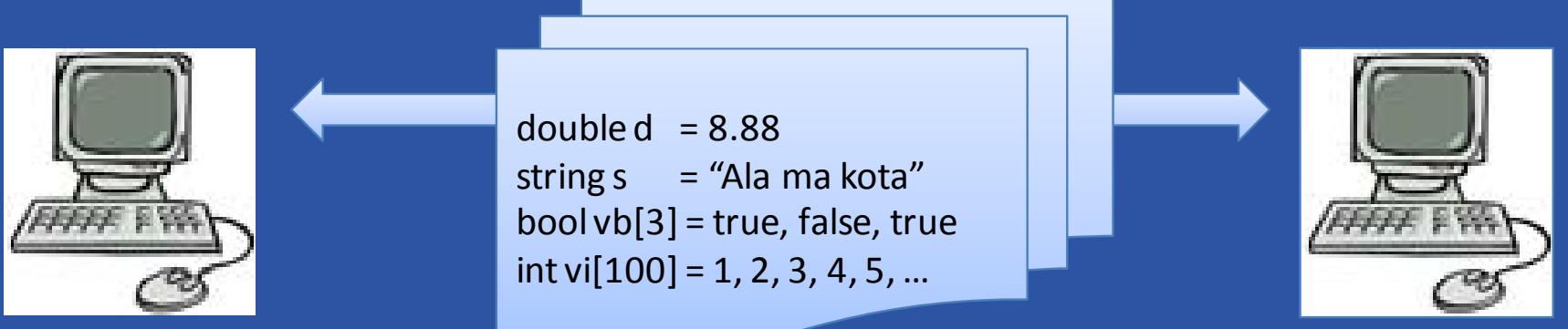
Dynamic data types and self-describing serialization

Usual approach, where IDL describes exchanged data:



Dynamic data types and self describing serialization:

- ❖ No need to manage IDLs
- ❖ Easier to upgrade the protocol



Conclusions

Thorough evaluation of middleware libraries in 2011 helped to choose three products that suited CERN Controls needs best. Further testing led to selection of ZeroMQ as a transport layer of the new RDA. To support seamless communication between different platforms as well as dynamic data types concept MessagePack was selected as a serialization library. The two products were used to prototype a simplified system that proved usability of the proposed solution. Afterwards, the user API was designed and it is currently being verified by the main library users.

After acceptance of the API the implementation of the core system and of the additional services will begin. Apart from unit testing the created code base will be gradually integrated and tested for interoperability with the existing operational system. The CMW team plans to start migration to the new system at the end of 2012.