Position Paper KPN Research
with respect to
CORBA and the WWW

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**Company**

KPN (Royal PTT Netherlands) is the main supplier of telecommunication and postal services in the Netherlands. The company was formed when the government owned telecommunication and postal companies were privatized in 1989. The Netherlands have a free telecommunication market since July 1997. KPN forms a holding company for PTT Telecom and PTT Post, with a joint turnover of about $10 billion US dollars.

KPN Research is the R&D division of KPN. The focus is mainly on telecommunication, although work for the postal services is also done. KPN Research is involved in research in the areas of Network technology, IT technology, Service development, Management, Security, Mail systems, Modeling techniques and many more.

**Introduction**

KPN Research is following CORBA for some time now. We have been involved in the development of distributed telecommunication frameworks like TINA and CORBA is currently the most potent technology to realize such distributed environments. Distributed platforms help us design the IT infrastructure that a modern telecommunication provider needs.

Many different research projects are using distributed platforms (mainly CORBA) as a means to abstract from the network and the network elements and provide a common layer that will facilitate interconnection. Examples of research fields of interest that use CORBA are IT architecture, Telecommunication Management, Intelligent Agents, etc.

The authors work within the Telecommunication Management department of KPN Research. Our focus used to be mainly on OSI Telecommunication Management Network (TMN) and the CMIP management protocol. Later we got involved in SNMP and the WWW as a means to manage devices, mainly because this technology is much cheaper and because a switch from telecom specific technology to general IT technology could be observed. Recently CORBA and Java have gained interest, in our group for a number of reasons:
- Flexibility
- The possibility for integration of legacy systems through CORBA
- Platform independence
- Centralized management with access to management information from any workstation on the network, through Web-based management and Java.

Agent technology is also potentially a killer technology for telecommunication management. The autonomy and artificial intelligence of Agents can be used to filter and correlate alarms, diagnose a problem and do simple repair operations, without the interference of an operator. The technology is far from mature, but it may benefit from work done for CORBA and Java.

**Research effort**

*Intelligent Agents* -- We are currently involved in Eurescom P712. This pan-European project works on intelligent and mobile Agents and their application for service and network management. So far we have produced a number of documents that give a domain analysis of existing frameworks, requirements and technologies for Agents. The project will also select some case studies that will result in agent system prototypes. One of the proposed case studies is on an agent for maintenance purposes. Agents from network operator A will communicate with Agents from network operator B to manage alarms, diagnose problems and repair (if possible). Another proposal is on the dynamic provisioning of Virtual Private Networks (VPN). Agents should be able to establish temporary network connections over which, for example, multi-party video services or secure IP communication can be offered to the parties involved. These Agents will probably use a combination of CORBA and Java and internet technologies.

*Telecom Management Lab* – We are building a lab for experiments with state-of-the-art management technologies, based on CORBA, Java, WWW, OO-database and several bridges to dominant management interfaces, like SNMP and CMIP. We want to integrate these technologies with HP Openview or other management platforms. Web-based management (management through web-browsers) is another key focus. By building our CORBA clients in Java, integration with the WWW is secured. We prefer Java compared to standard HTML because it is more flexible and powerful.
Statements

For the purpose of discussion we like to make the following statements, that represent our view of where CORBA and the WWW are going:

- The integration of CORBA and the WWW is essential. It extends CORBA with a mobile code system and it extends Java with distributed computing. The sum is more than two!
- Agents are an important new technology. Java and CORBA are important accelerators for Agents: Java is a simple platform, gives code mobility, is widely available and easy to use and program and CORBA can act as a basic infrastructure for Intelligent Agents
- OMG’s Mobile Agent Framework (MAF) may add further useful features to CORBA that make it even more useful for Agents. Standard CORBA is too limited.
- CORBA may become the dominant infrastructure for management. If operational systems are based on CORBA, we don’t need a separate management protocol like SNMP. For the time being, a gateway between SNMP/CMIP and CORBA seems to be the way to go.
- The integration of CORBA, Java and the World Wide Web is a major development/milestone and will perhaps lead to a killer application for Agents
- We are still a bit unclear on competing technologies like Java RMI and ActiveX/OLE/COM. Java RMI seems to be a simple mechanism to do CORBA-like thing in a pure Java environment, but lacks the enterprise scope of CORBA. ActiveX/OLE/COM is technically inferior to Java/CORB but has the huge advantage of being the dominant desktop component system. It is questionable if Java Beans or OpenDoc will ever be able to challenge OLE/COM. Bridging between COM and CORBA seems to be the way to go.