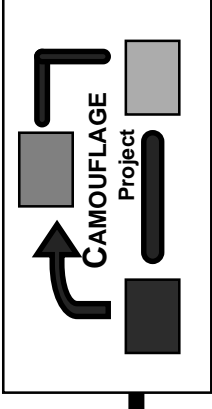


The CAMOUFLAGE Project - Introduction of TINA into Telecommunication Legacy Systems

Dr. Eckhardt Holz
Humboldt-University Berlin
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holz@informatik.hu-berlin.de

TINA Conference '97

Santiago de Chile, 17-20 November 1997

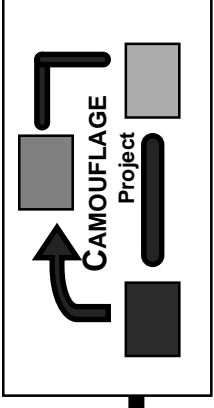


Provision of TINA Object Interactions through B-ISDN in ATM Networks

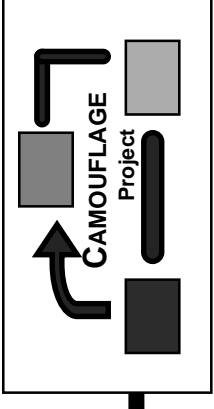
Dr. Eckhardt Holz
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GLOBECOM '97

Phoenix, November 1997



-
- **The CAMOUFLAGE project**
 - **Support for operational interactions**
 - **Support for stream interactions**
 - **Related work**
 - **Conclusions**
-



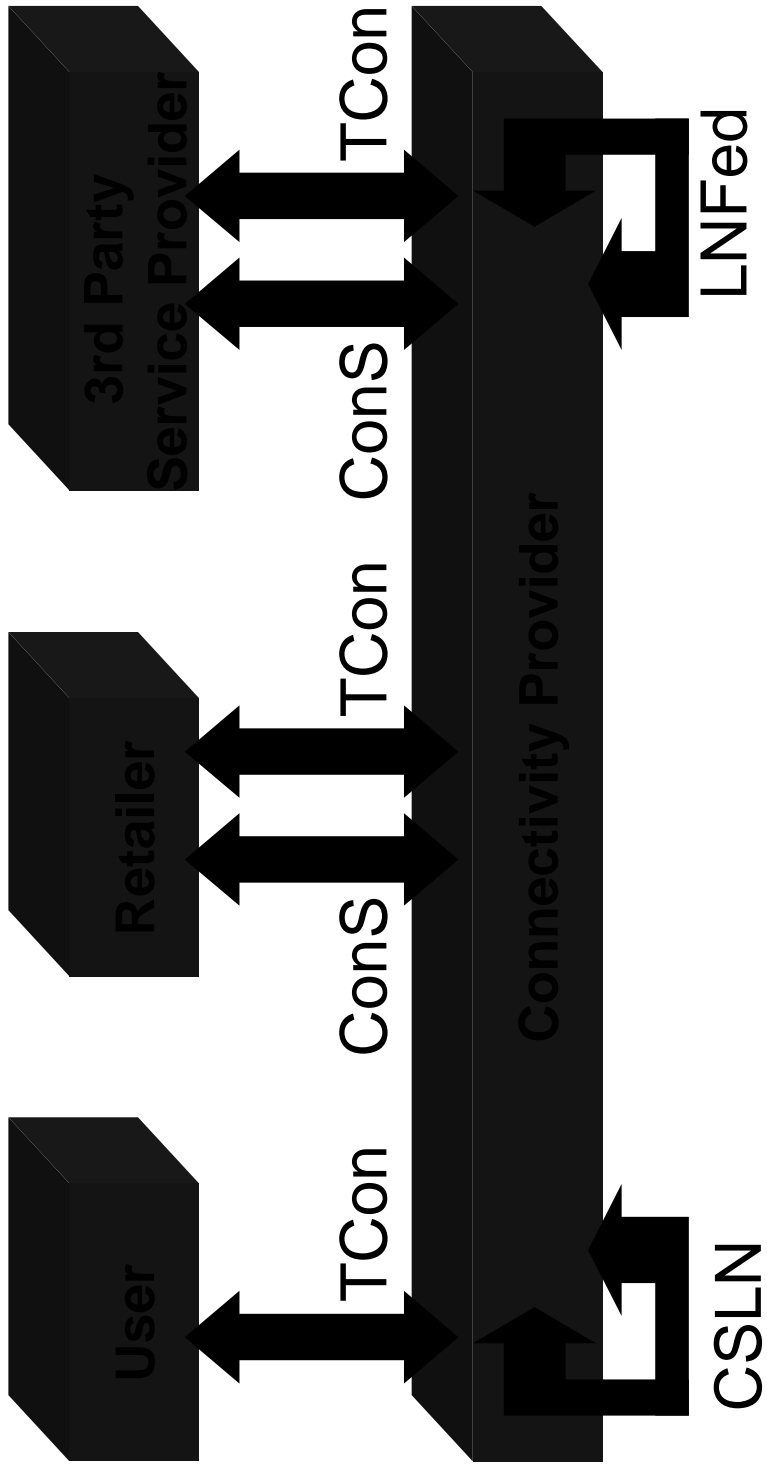
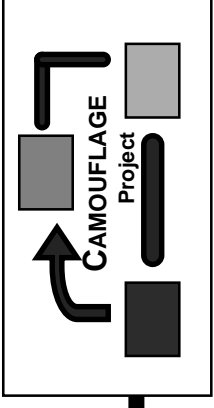
CAMOUFLAGE

Development of a B-ISDN based TINA Distribution and Communication Platform (DPE)

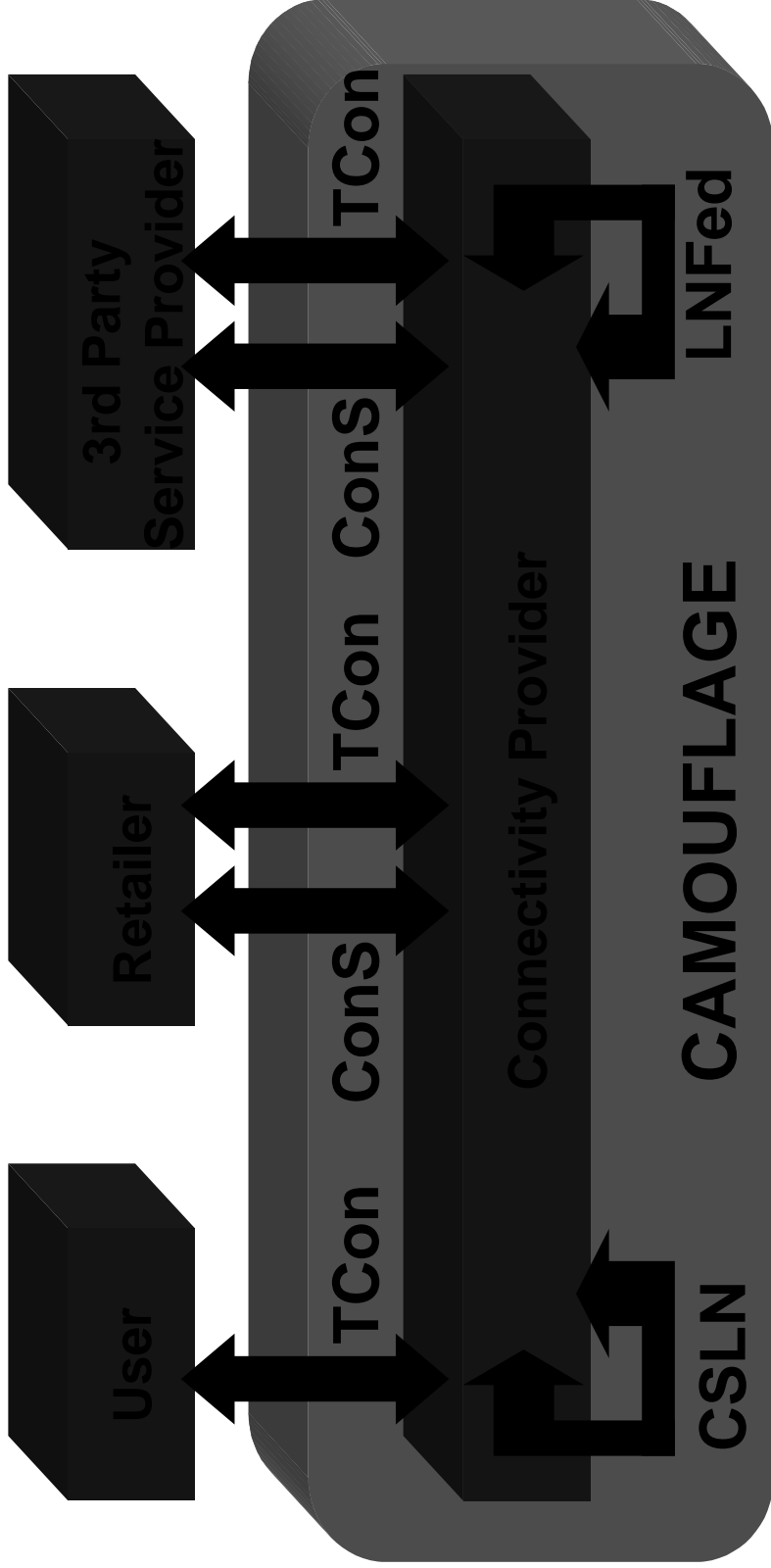
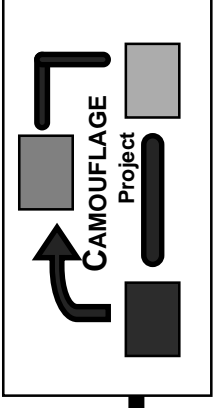
- joint research project of Deutsche Telekom AG, Humboldt University Berlin and Technical University Ilmenau
- September 1996 - March 1999
- Cooperation with GMD-Fokus (Tangram) and OOC Inc. (OmniBroker)



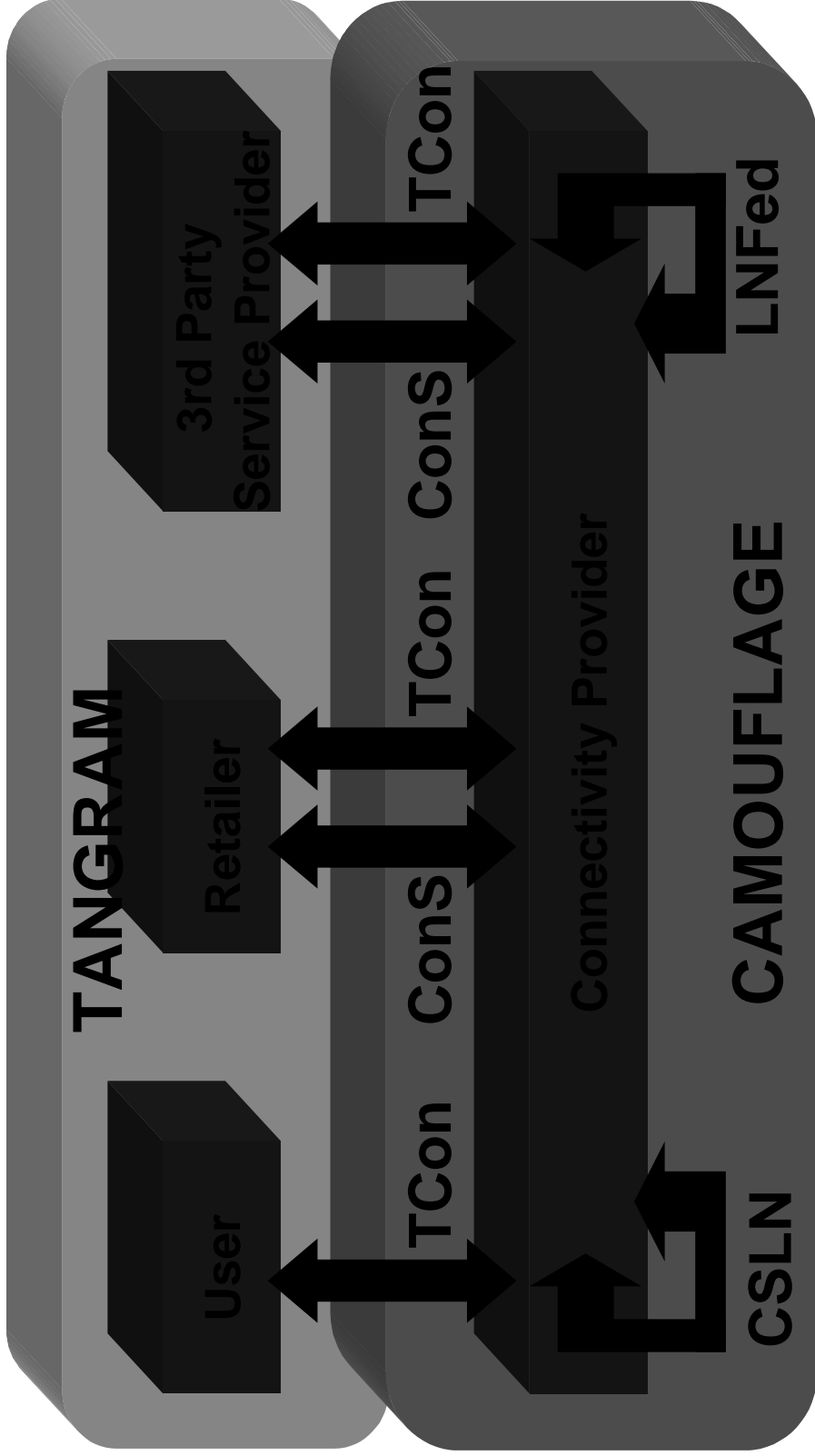
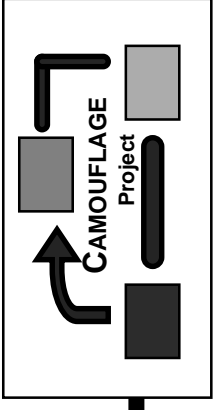
Business Model

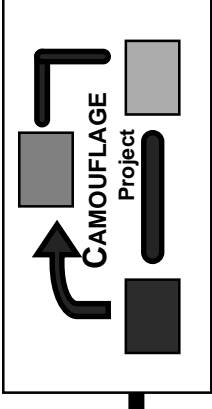


Business Model



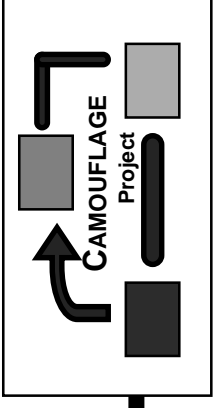
Business Model



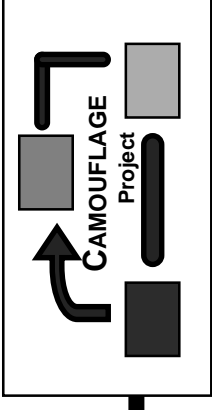


Main Tasks

- **Provision of Support for Operational Interactions (kTN)**
 - **Provision of Support for Stream Interactions (TN)**
 - **make use of existing capabilities of the telecommunication network (B-ISDN)**
 - **enable interworking with telecommunication services**
 - **reuse existing software (CORBA)**
 - **avoid changes to the existing network**
-



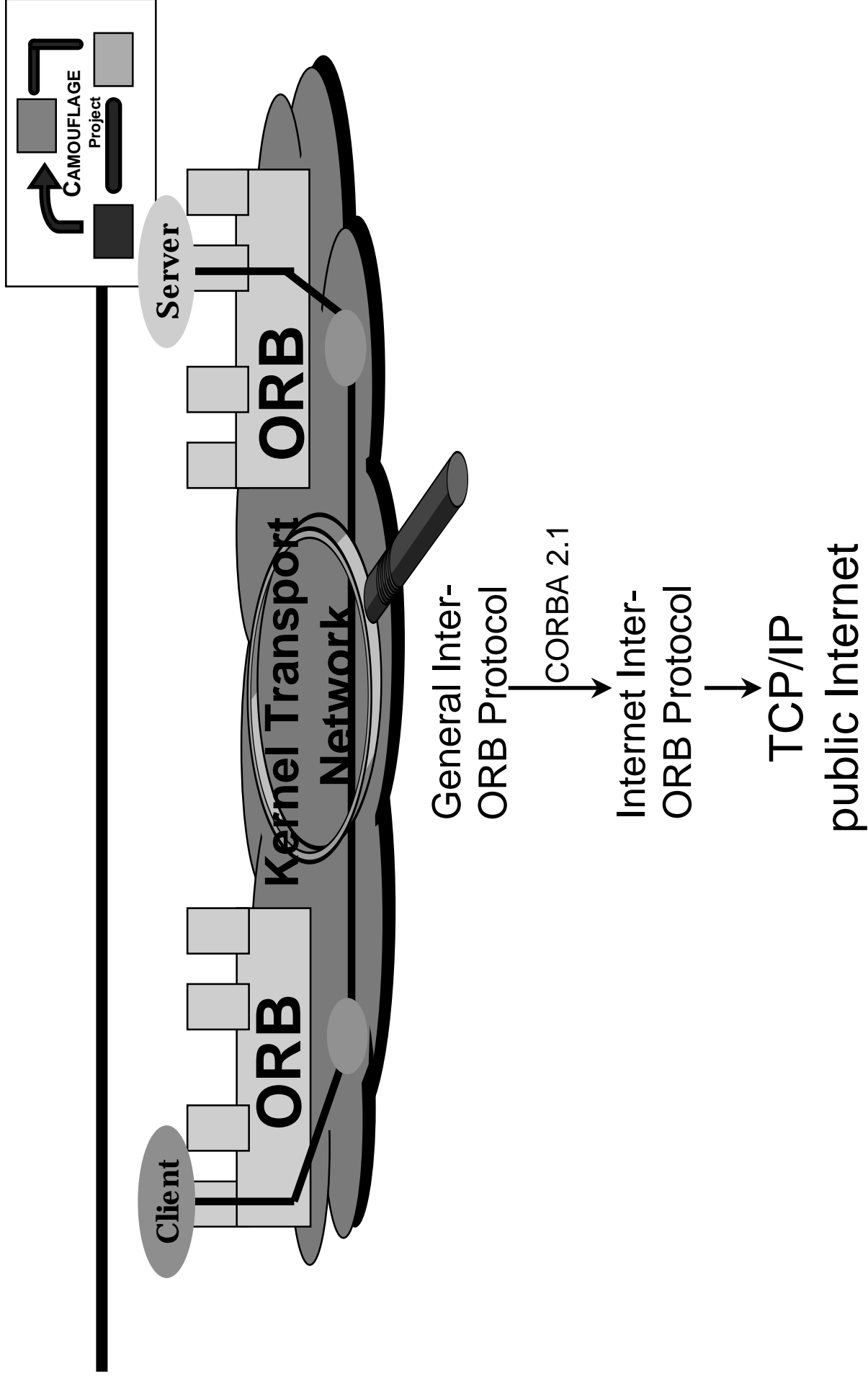
-
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-

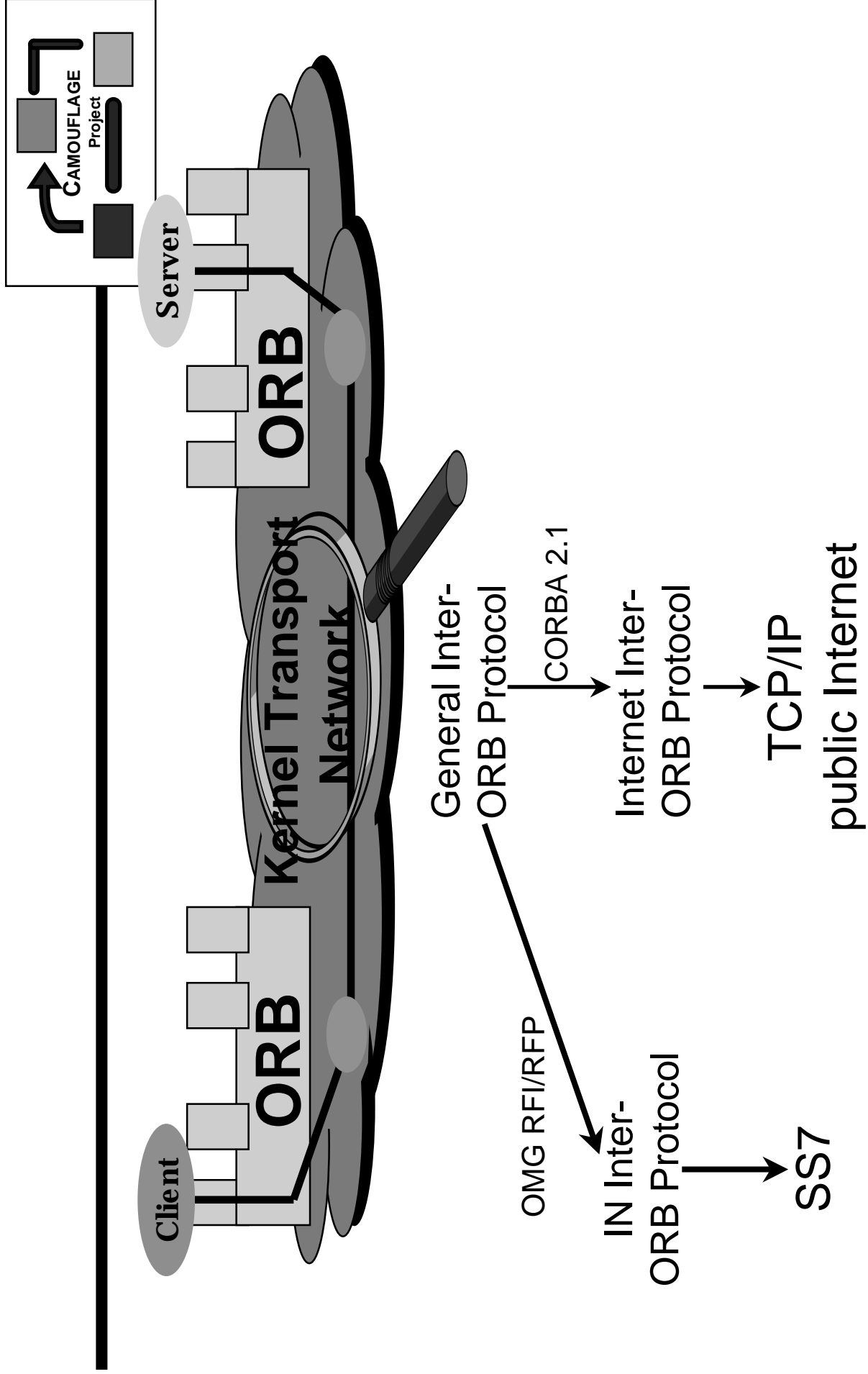


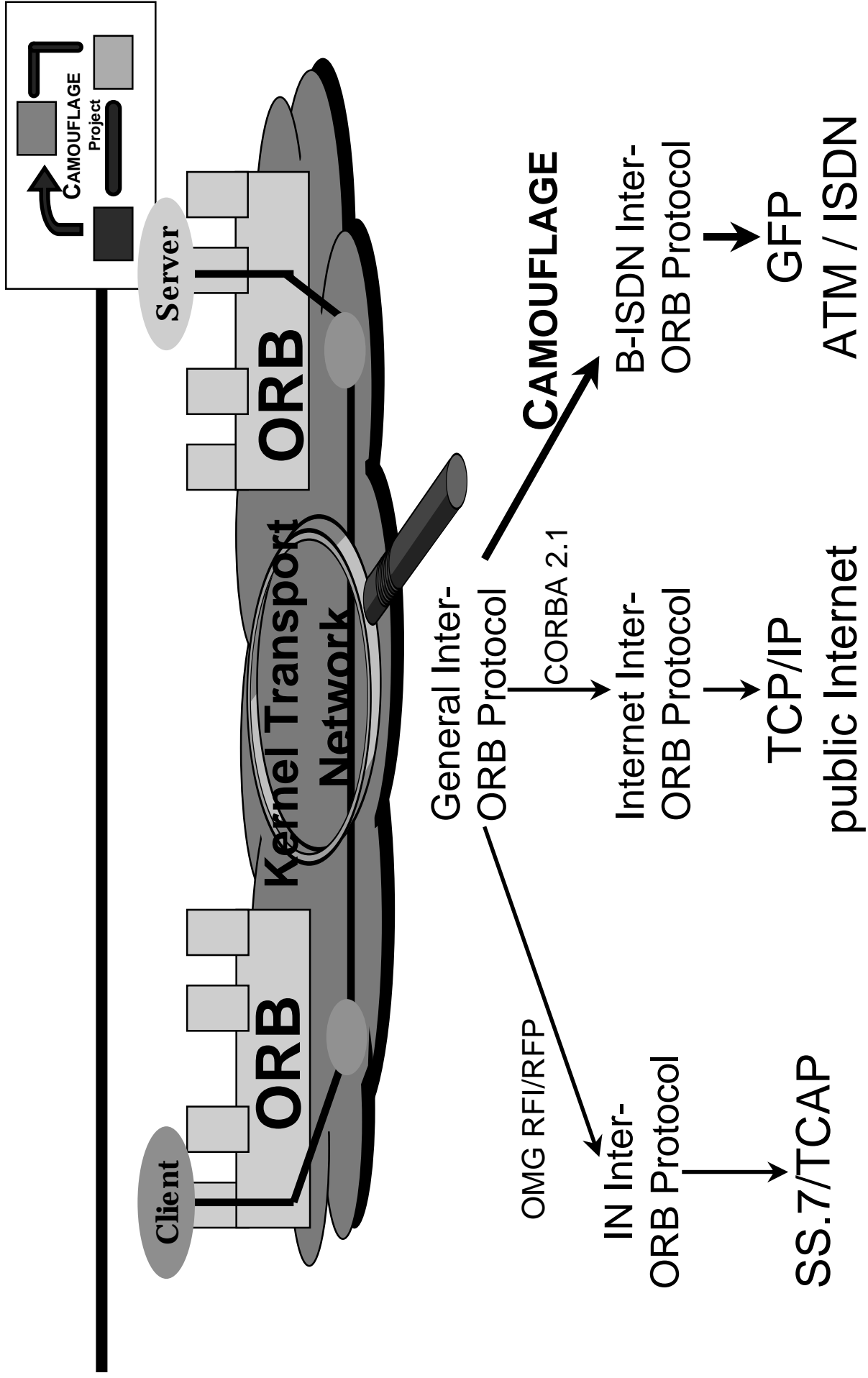
Support for Operational Interactions

- **Inter-node communication for operation calls**
- **Interrogations and announcements**
 - invocation(s) transmission client → server
 - termination(s) transmission server → client
- **CORBA: General Inter-Orb Protocol (GIOP)**

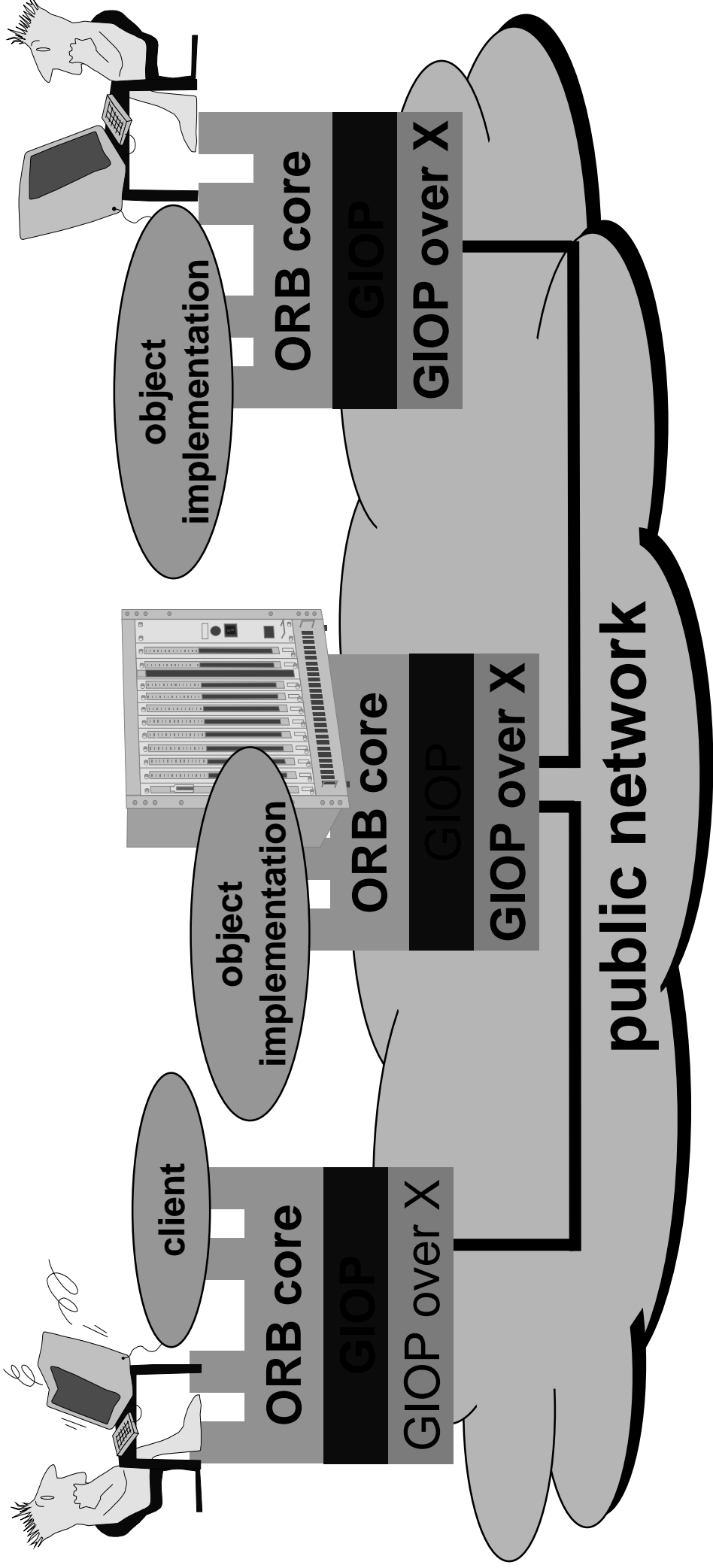


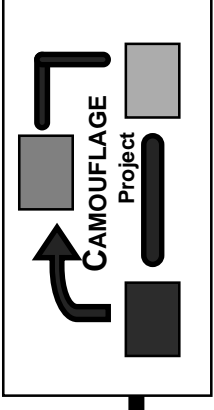






Vision





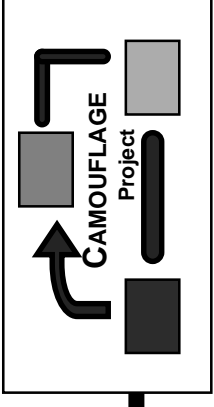
Handling of multiple protocols

Current situation:

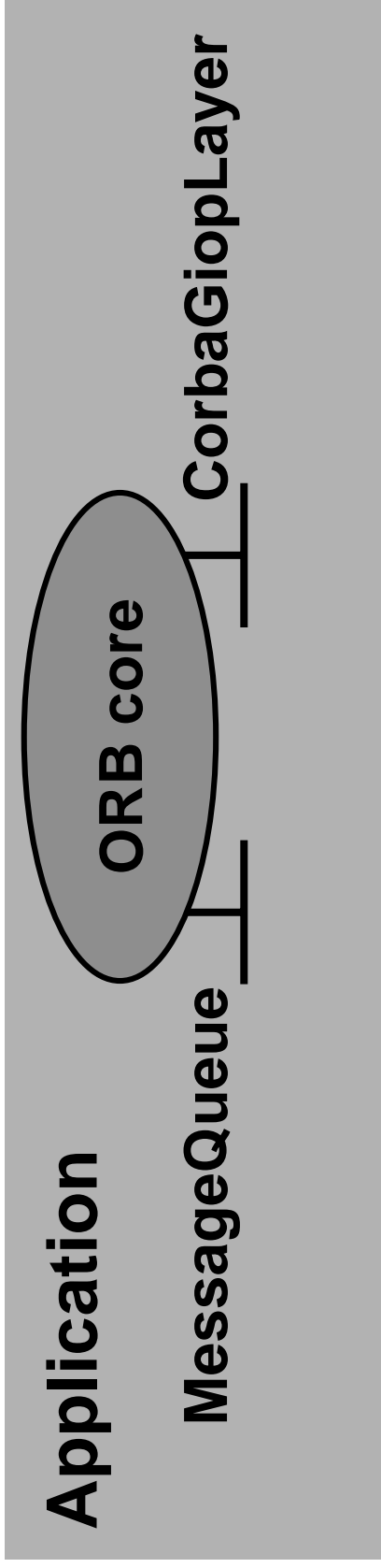
- GIOP and IIOP are tightly coupled and integrated in the ORB
- mostly no direct access to ORB code

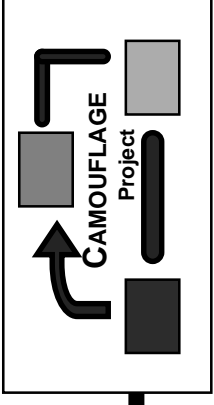
Each new protocol requires changes to the ORB!

➤ Use a common approach to provide a transport mechanism for GIOP messages.

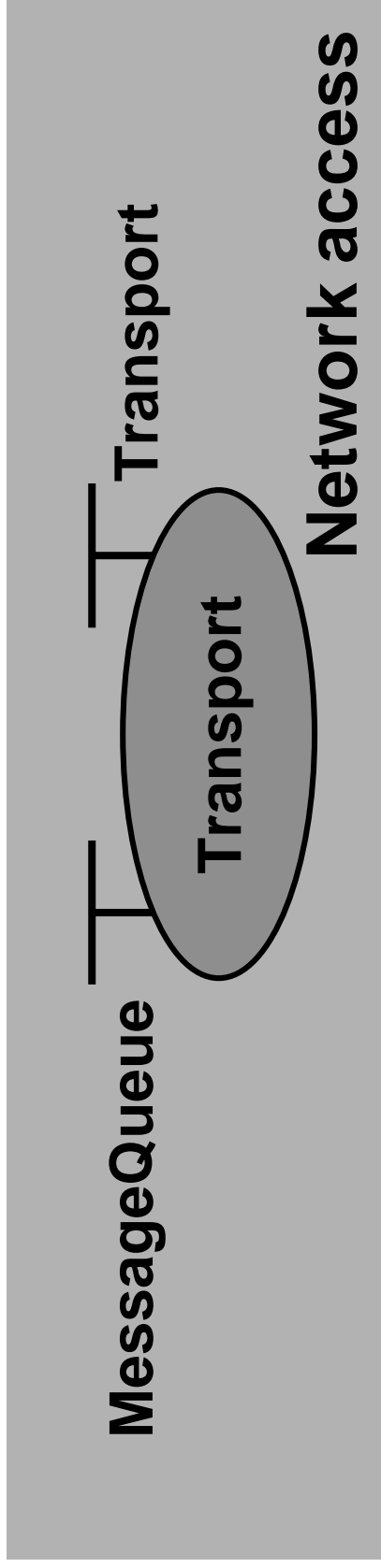
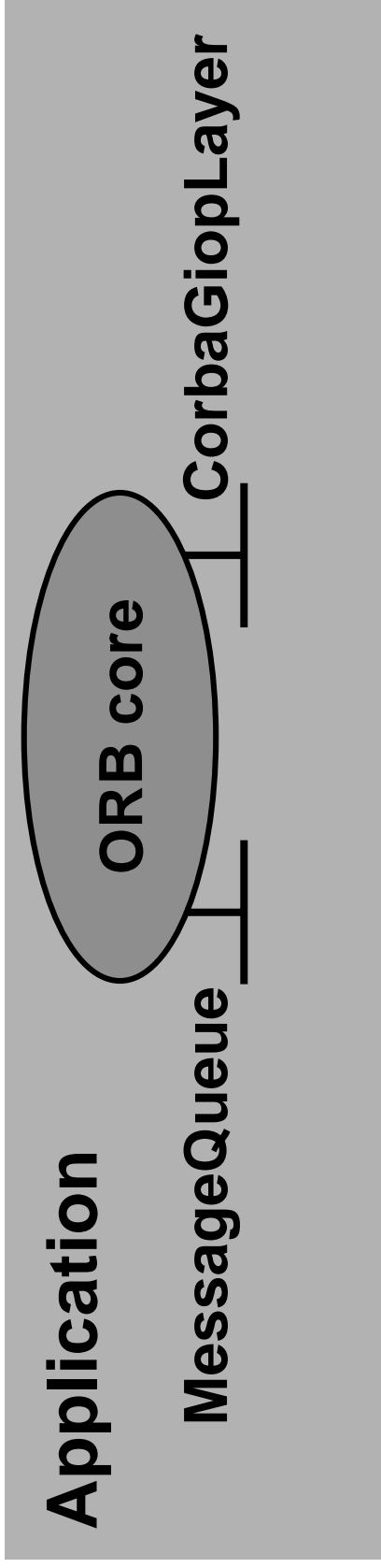


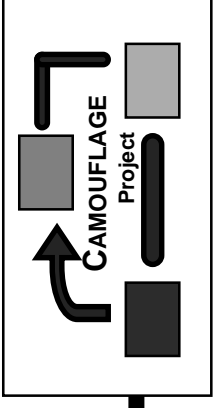
Open Communication Interface



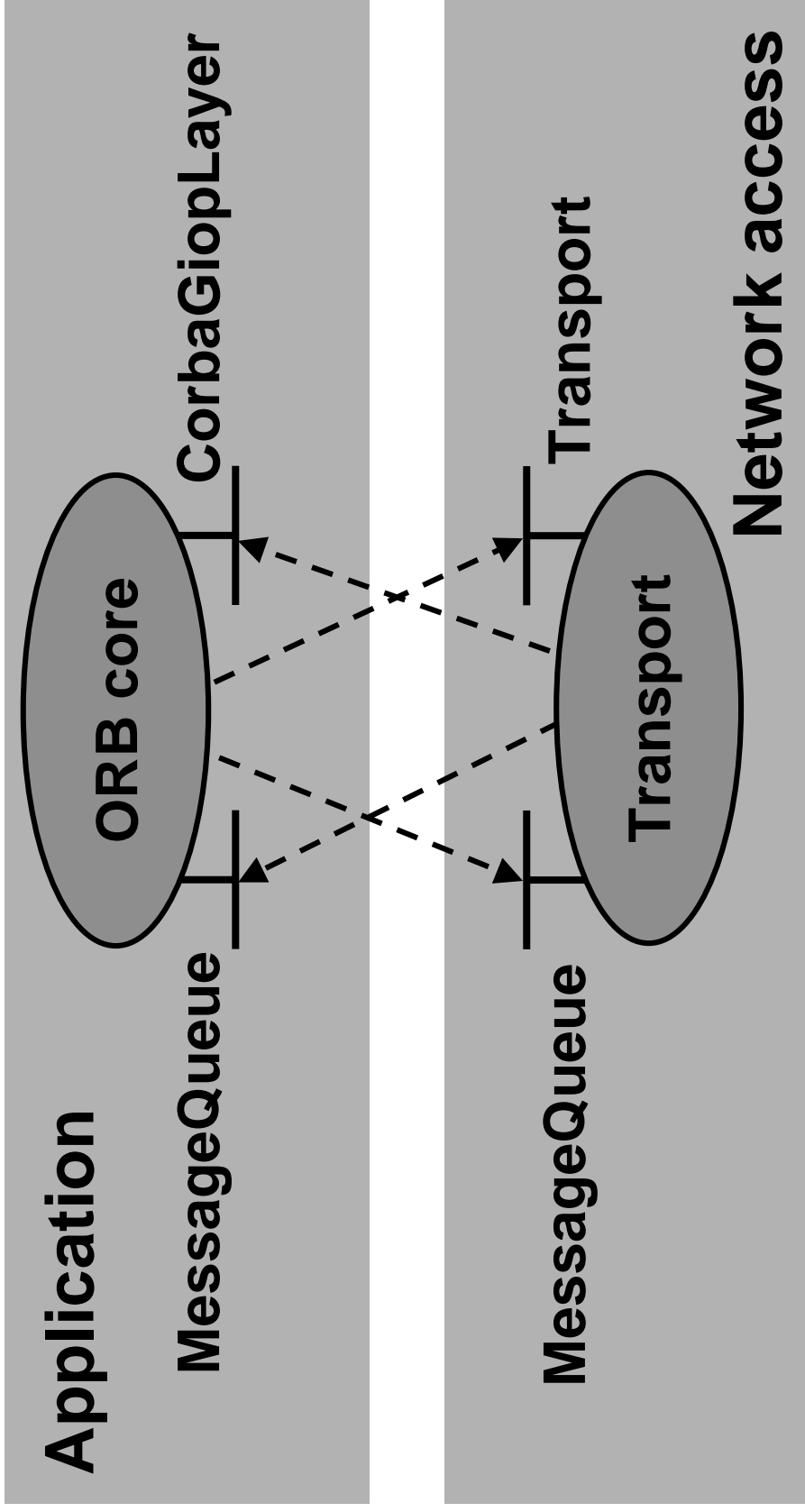


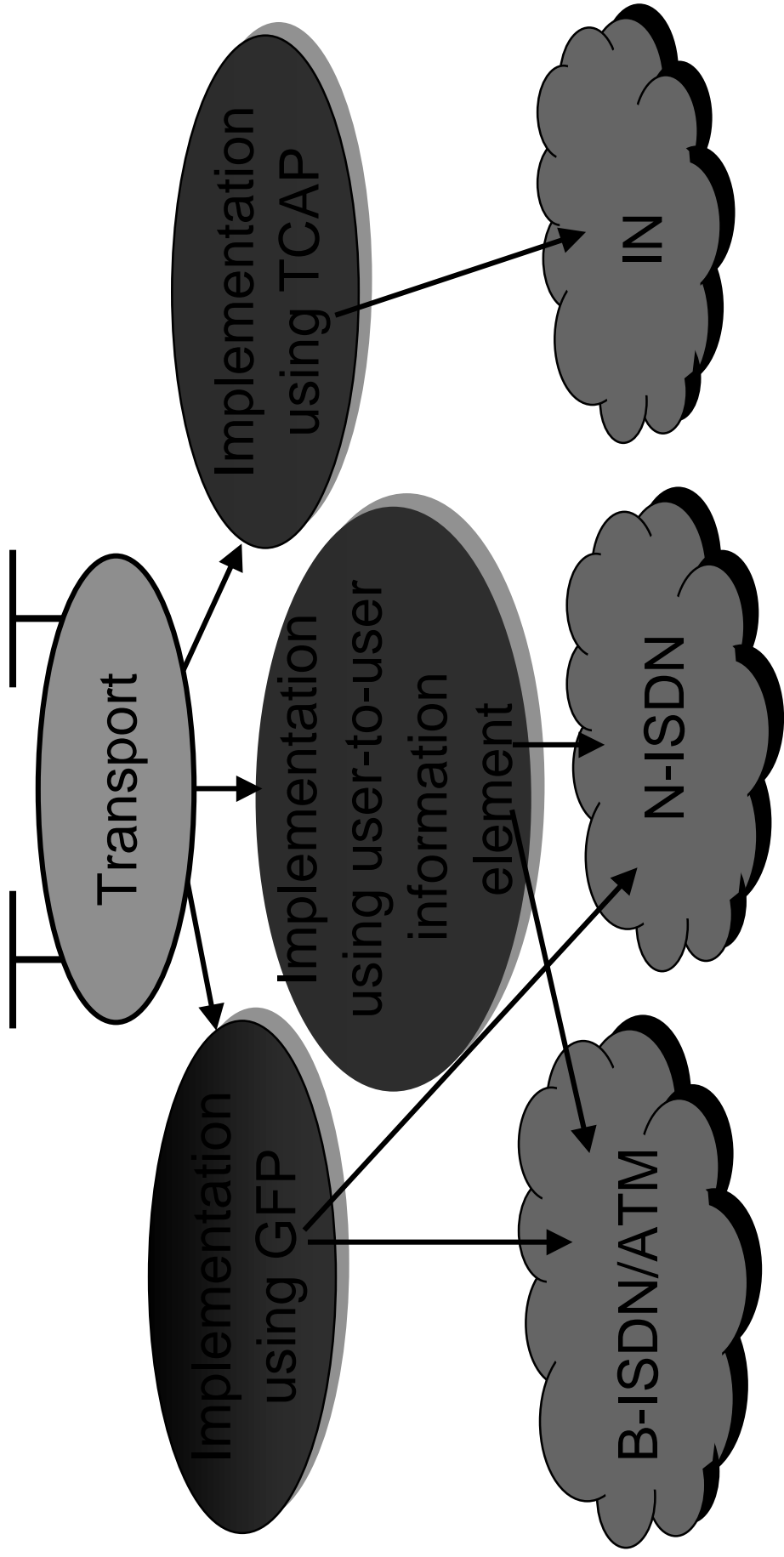
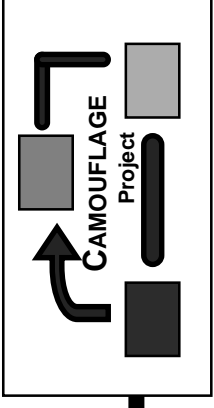
Open Communication Interface

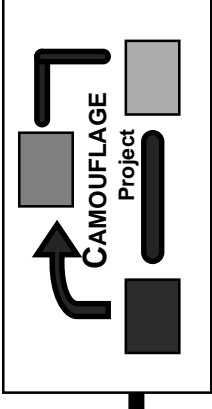




Open Communication Interface

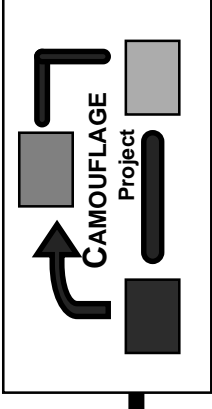






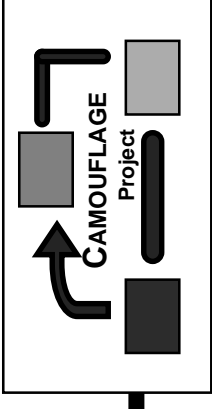
Generic Functional Protocol - GFP

- **international standard: ITU-T Q.2932.1**
 - **specified for B-ISDN CS 2 (UNI)**
 - **a means to exchange ROSE APDUs at the UNI**
 - **two addressing mechanisms**
 - **three transport modes: CLBI, COBI, BR**
 - **TCAP is candidate for mapping into equivalent functions at the NNI**
-



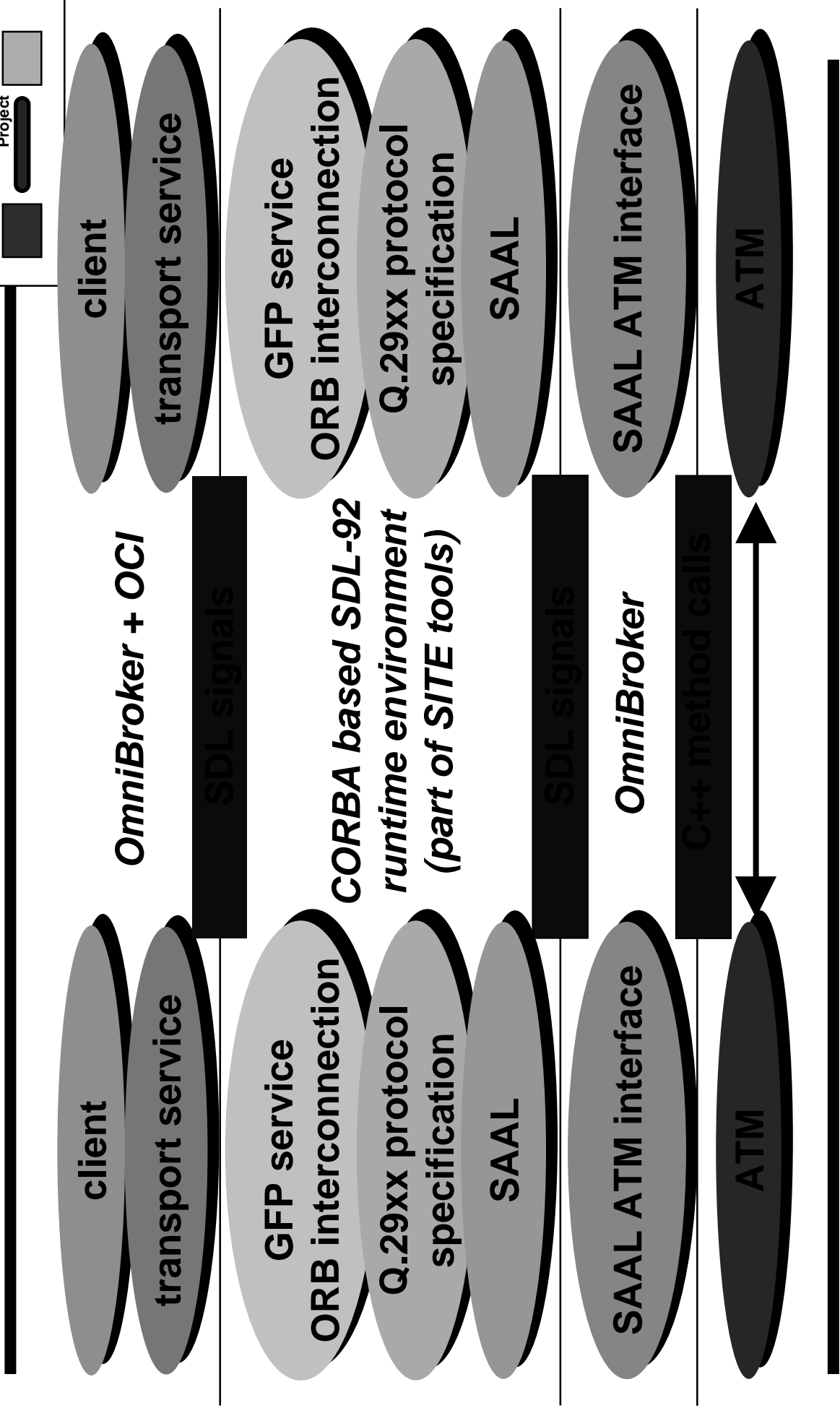
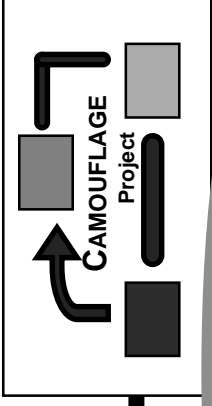
GFPIOP - modes

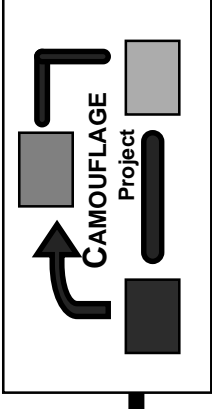
- **CLBI connection less bearer independent**
 - default
 - fast, but possibly insecure
 - announcements
 - **COBI connection oriented bearer independent**
 - security/billing/authorization reasons
 - explicit bindings
 - **BR bearer related**
 - large invocation/termination parameters
 - server object requirement
-



GFPIOP - summary

- **Message mapping**
 - **IOR extension (additional profile body)**
 - address following numbering plan (e.g. E.164)
 - number type
 - phone number
 - Object Adapter identification
 - specification of binding characteristics
 - transport mode
 - other binding characteristics
 - **OCI**
-

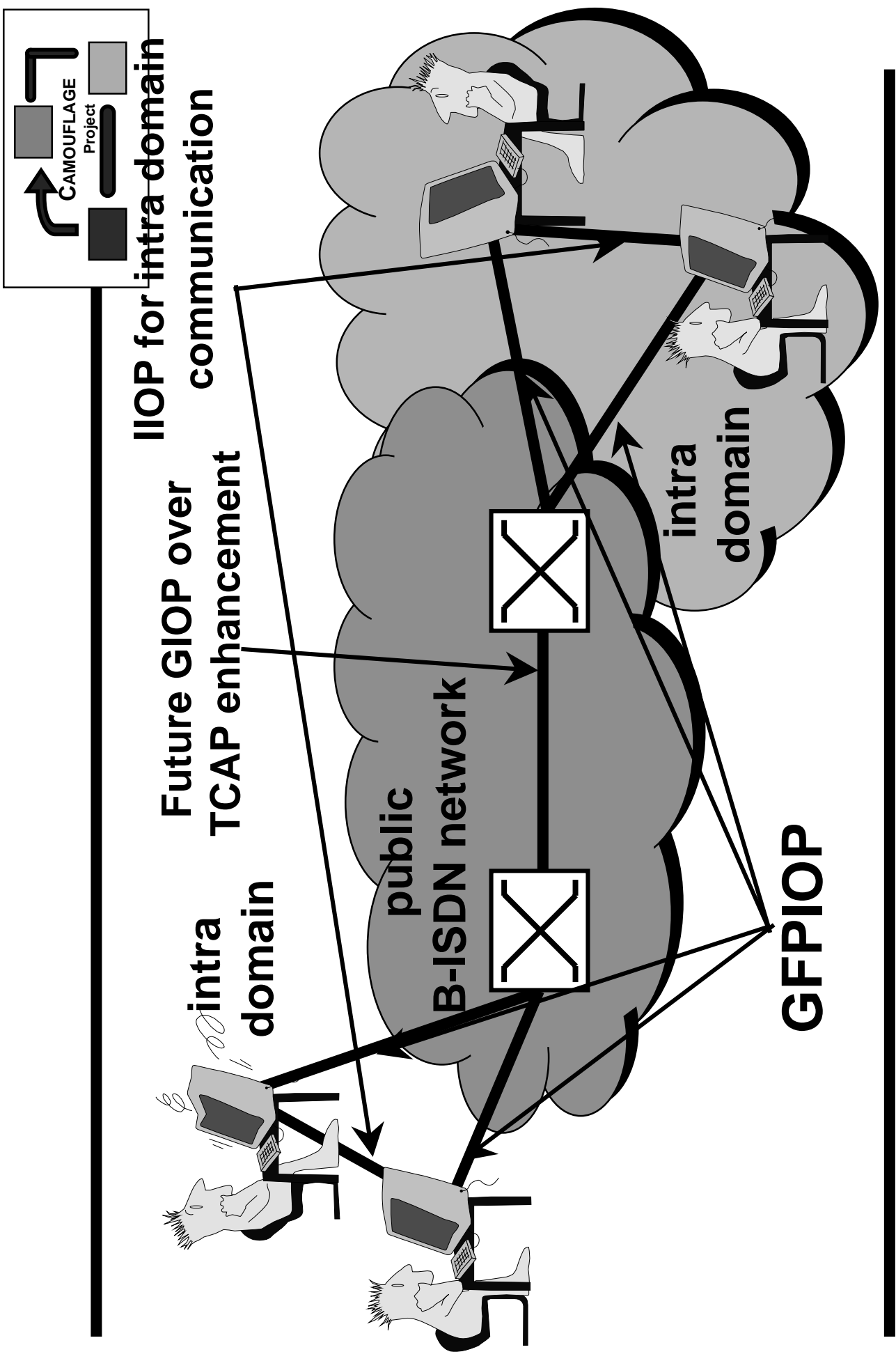


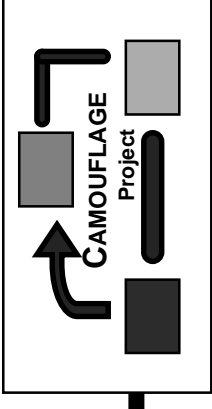


IN and N-ISDN mappings

- **TCAP**
- **ISDN user-to-user information element**
 - Q.931, additional Q.957.1
- **ISDN functional protocol**
 - Q.932
 - mapping and IOR similar to GFPIOP
 - not end-to-end transport of messages!!

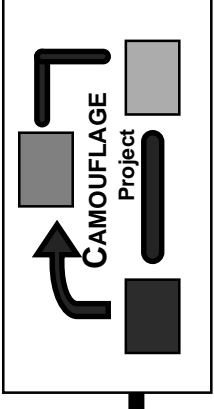






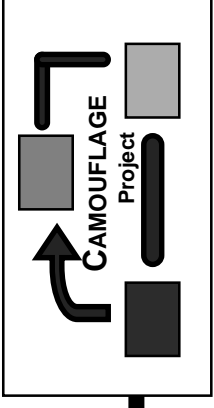
Advantages

- **fast**
 - no extra set-up before operation call necessary
 - high bandwidth
 - less protocol layers
 - **safe**
 - guaranteed by telecommunication protocols
 - **scalable**
 - selection of mode according to parameter size
 - dynamic transport selection
 - **cost-saving**
 - utilisation of existing networks
 - no new infrastructure necessary
 - **large group of potential users within reach**
-

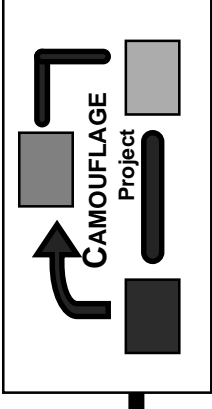


Status

- **GIOP to GFP mapping defined and implemented**
 - **Successful demonstration of GFPIOP based kTN**
 - **first version of OCI (ORB part and B-ISDN part) under test**
 - **IN and N-ISDN mappings started**
-

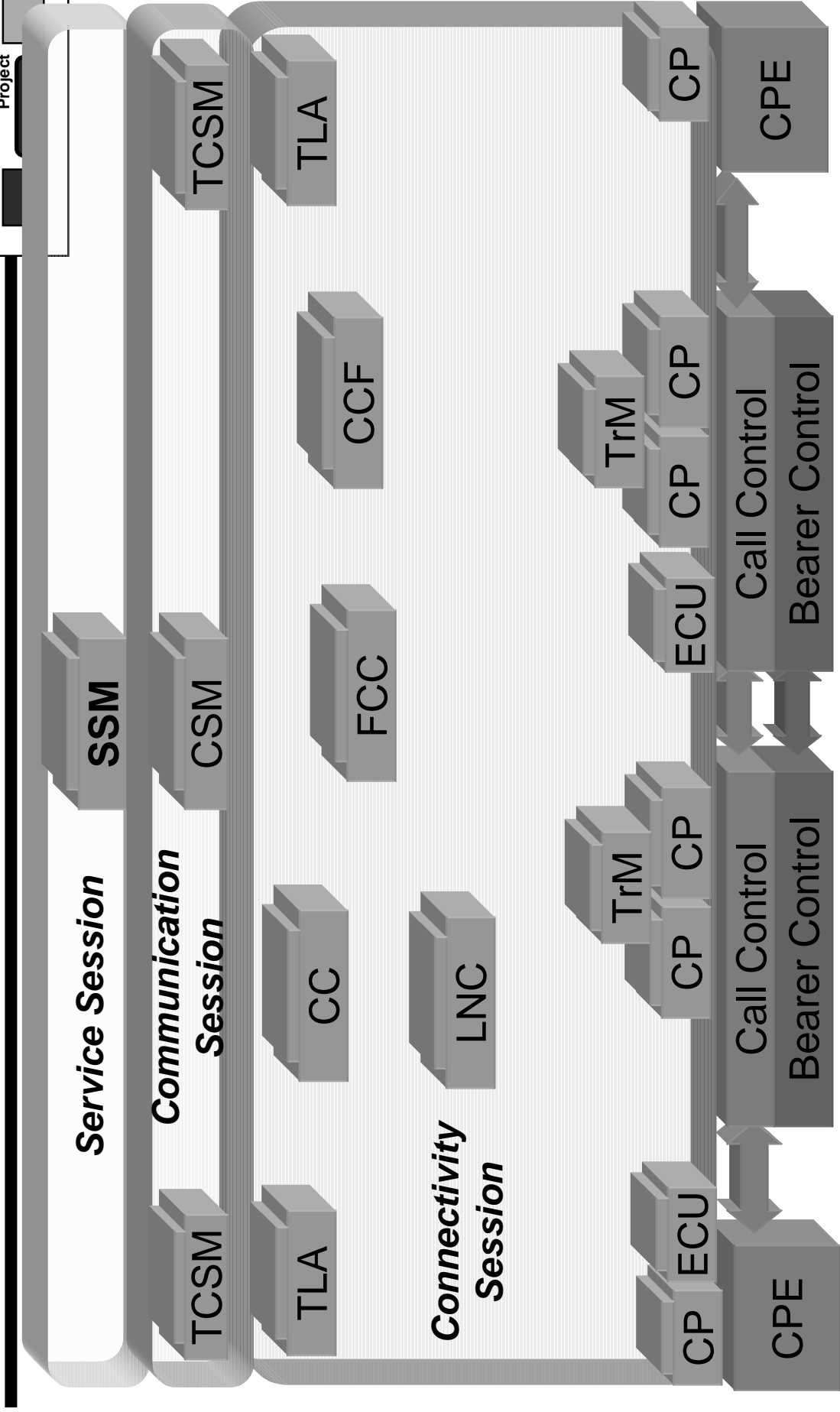
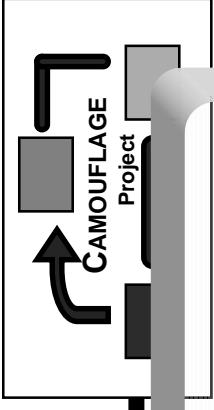


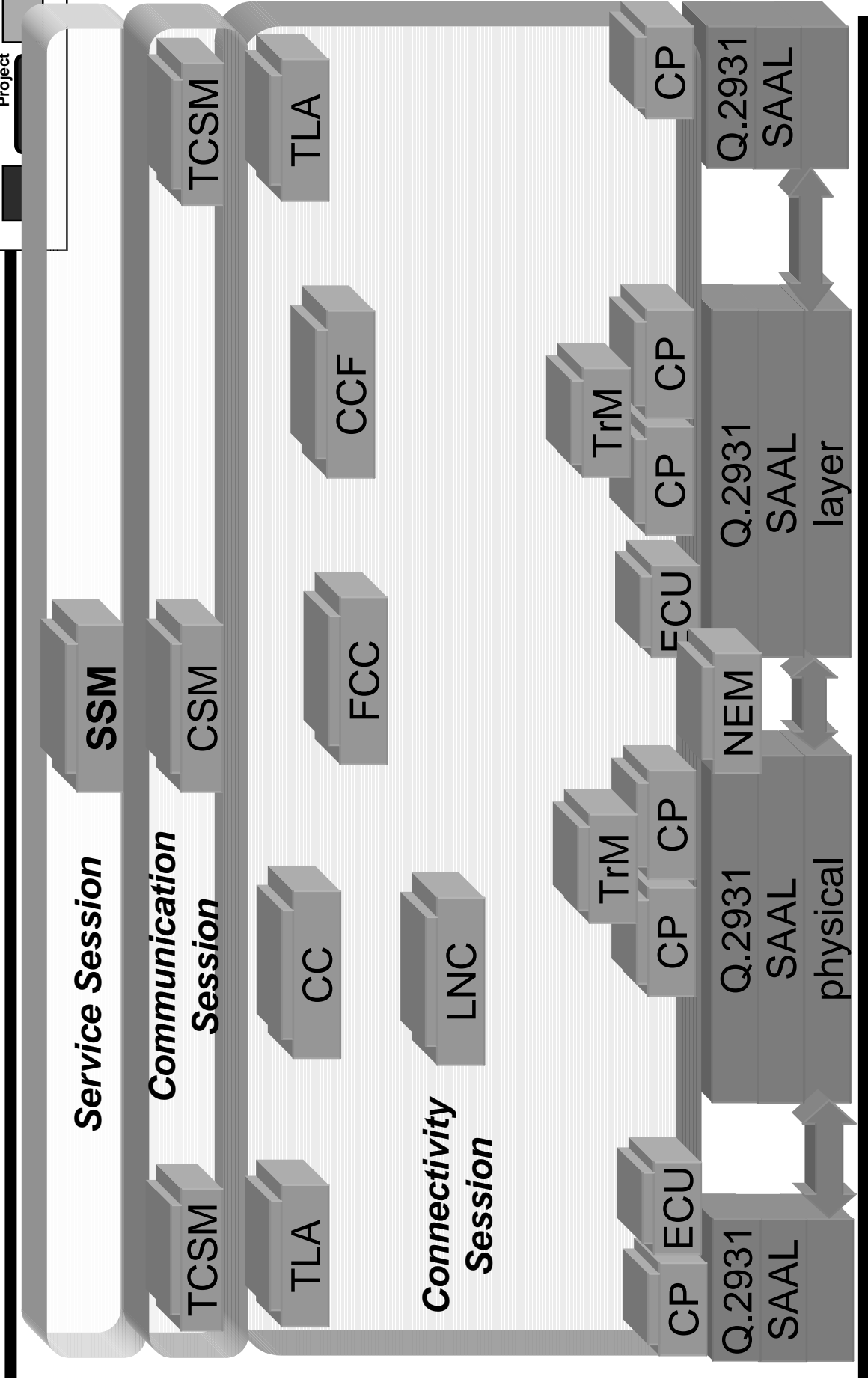
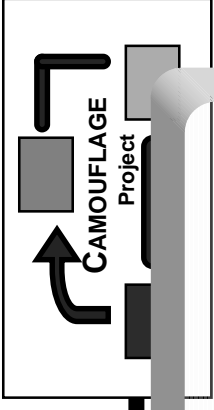
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-



Support for Stream interactions

- **Provision of engineering mechanisms for computational stream bindings**
 - TINA Service Architecture and Network Resource Architecture
 - OMG AV streams
 - **Concentration on Connectivity Session**
 - Connectivity Management - CyM
 - CSM/TCSM (service session) are clients of CyM
 - **Utilisation of B-ISDN capabilities**
 - user-initiated/network-initiated calls
 - point-to-multipoint connections
 - guaranteed QoS
 - capabilities to cope with administrative borders
-





Service Session

Communication Session

Connectivity Session

SSM

CSM

CC

FCC

CCF

TLA

TLA

LNC

CP

ECU

CP

CP

ECU

CP

CP

CP

Q.2931

SAAL

Q.2931

SAAL

NEM

Q.2931

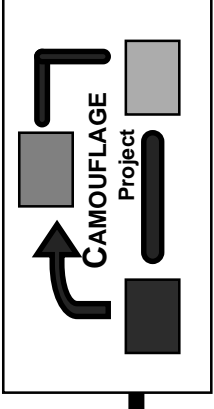
SAAL

Q.2931

SAAL

physical

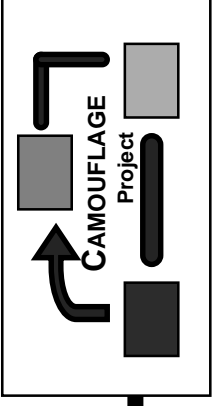
layer



Status

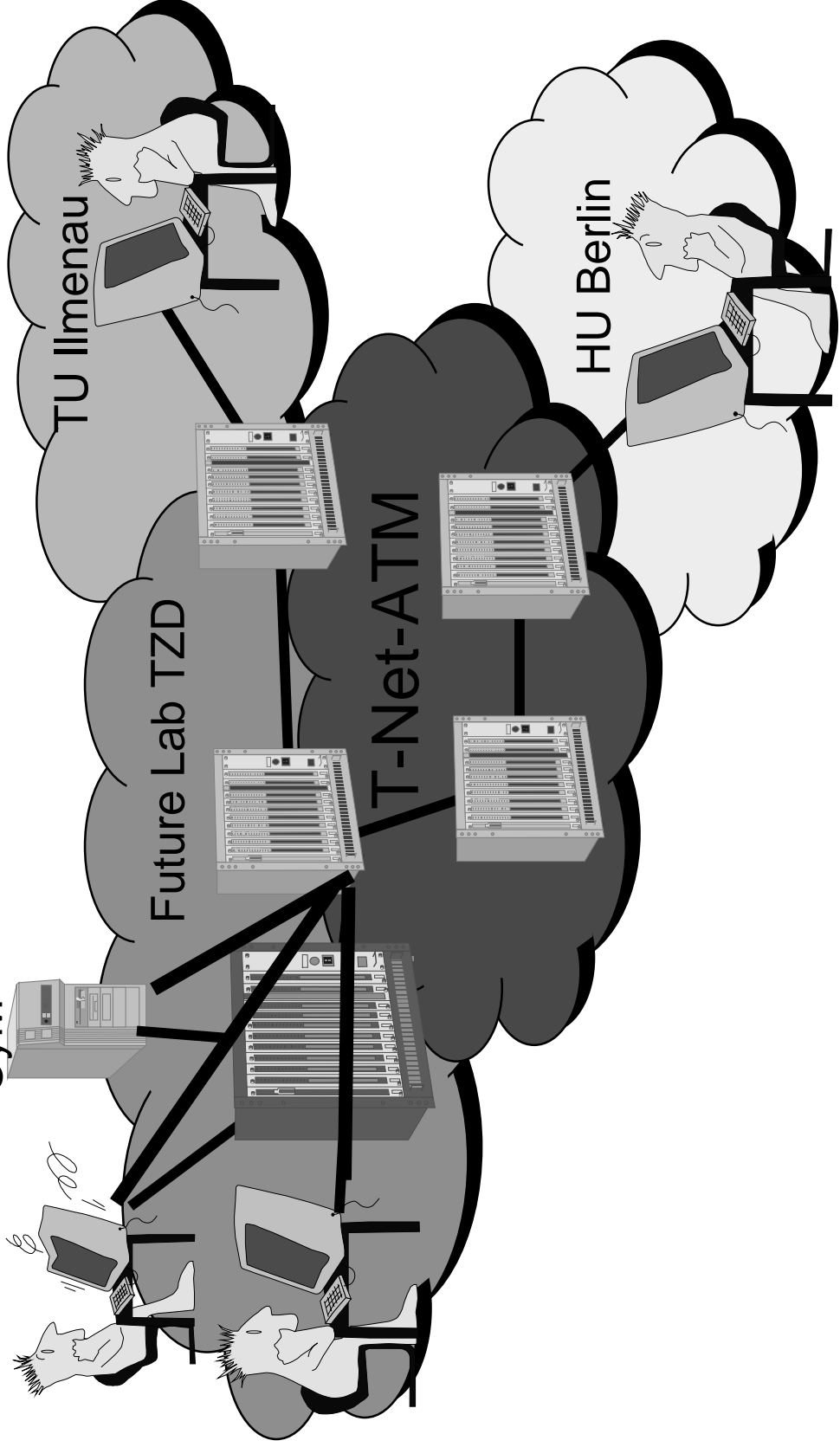
- **Specification phase**
 - initial IDL description of CyM objects
 - specification of ECU and NEM
- **Comparison with OMG approach**
- **Scenarios for introduction of CyM**

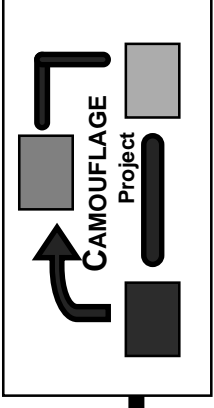




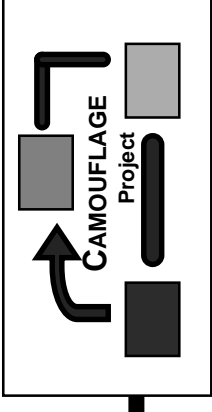
CAMOUFLAGE

CyM





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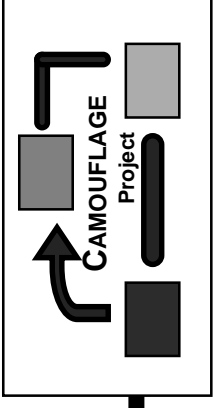


Related work & further reading

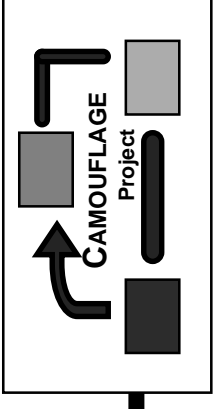
- **EURESCOM Project P715**
- **TINA DPE Working Group**
- **ITU-T Study Group 10 Q.2, Q.3**
- **OMG Telecom Domain Taskforce, A/V streams**

- **<http://camouflage.informatik.hu-berlin.de/camouflage>**
- **<http://site.informatik.hu-berlin.de>**



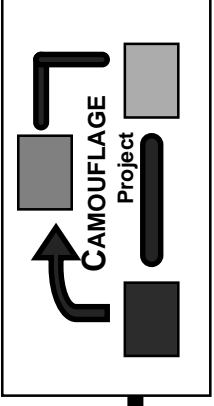


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Conclusions

- **Development of a TINA DPE by connecting CORBA islands via telecommunication networks is possible**
 - **OCI supports the use and dynamic selection of multiple interoperability protocols**
 - **Implementation of GFPIOP proves the expected advantages**
 - **CyM development is ongoing work and will cover TINA NRA aspects as well as OMG A/V streams**
-



Thank you

