

# A brief introduction to the ProViT project



# Background

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- ProViT stands for:  
*Digital Product Development with Virtually Cooperating Teams using Optical Networks*
- Project is funded by **bmb+f**, runs until end of 2003
- Cooperation between Fraunhofer Institutes („Fusion projects“):
  - Fraunhofer Institute for Media Communication (IMK), St. Augustin
  - Fraunhofer Institute for Production Systems and Design technology (IPK), Berlin
  - Fraunhofer Institute for Computer Graphics (IGD), Darmstadt
  - Fraunhofer Institute for Production Technology (IPT), Aachen
  - Computer Graphics Center (ZGDV), Rostock



# Objectives

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ProVit aims at :

*building up immersive Telepresence systems for design review, which run over high-bandwidth networks*

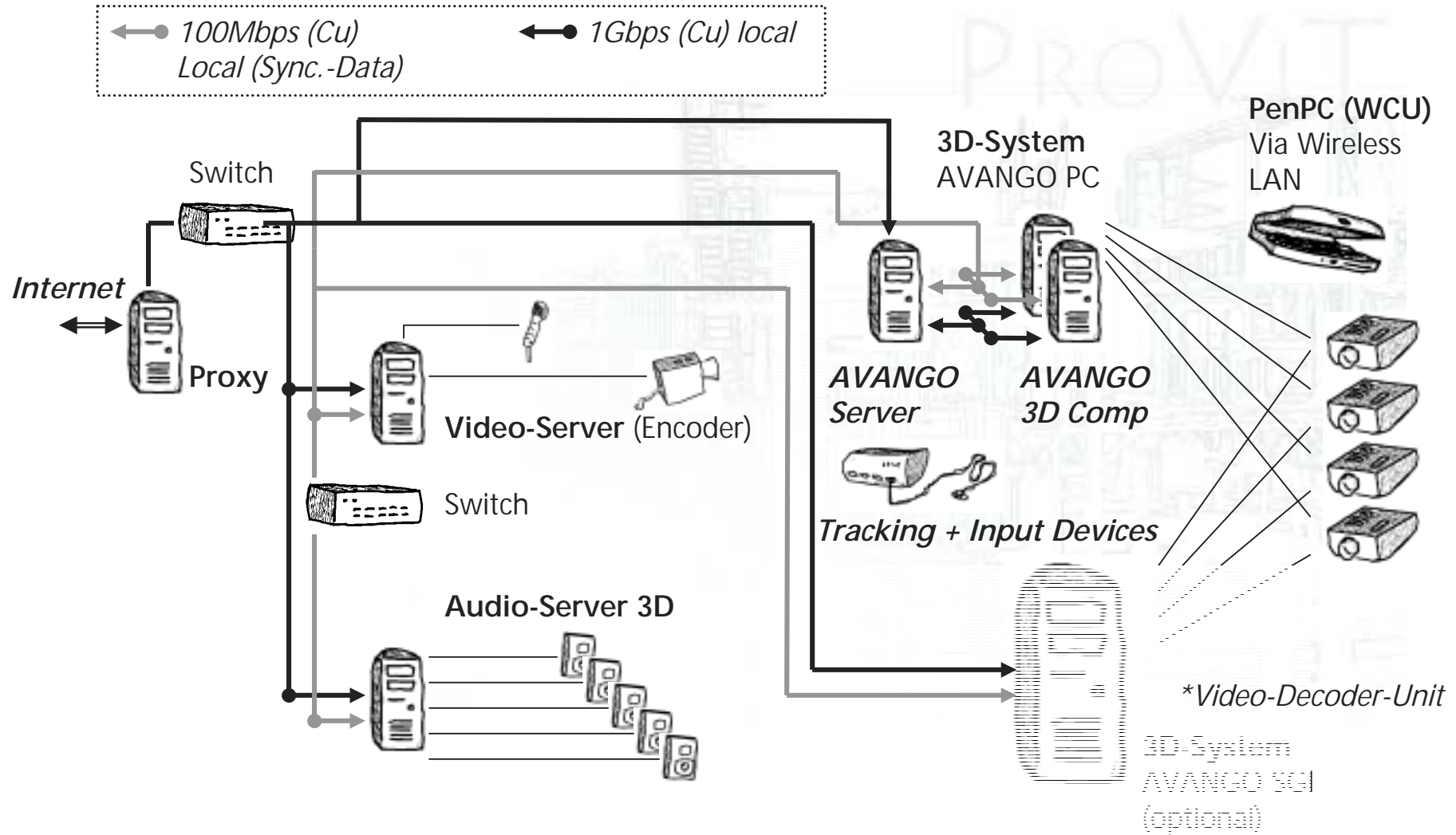
Design review is applied on machinery, ship, and airplane building scenarios

Several components are under development that allow:

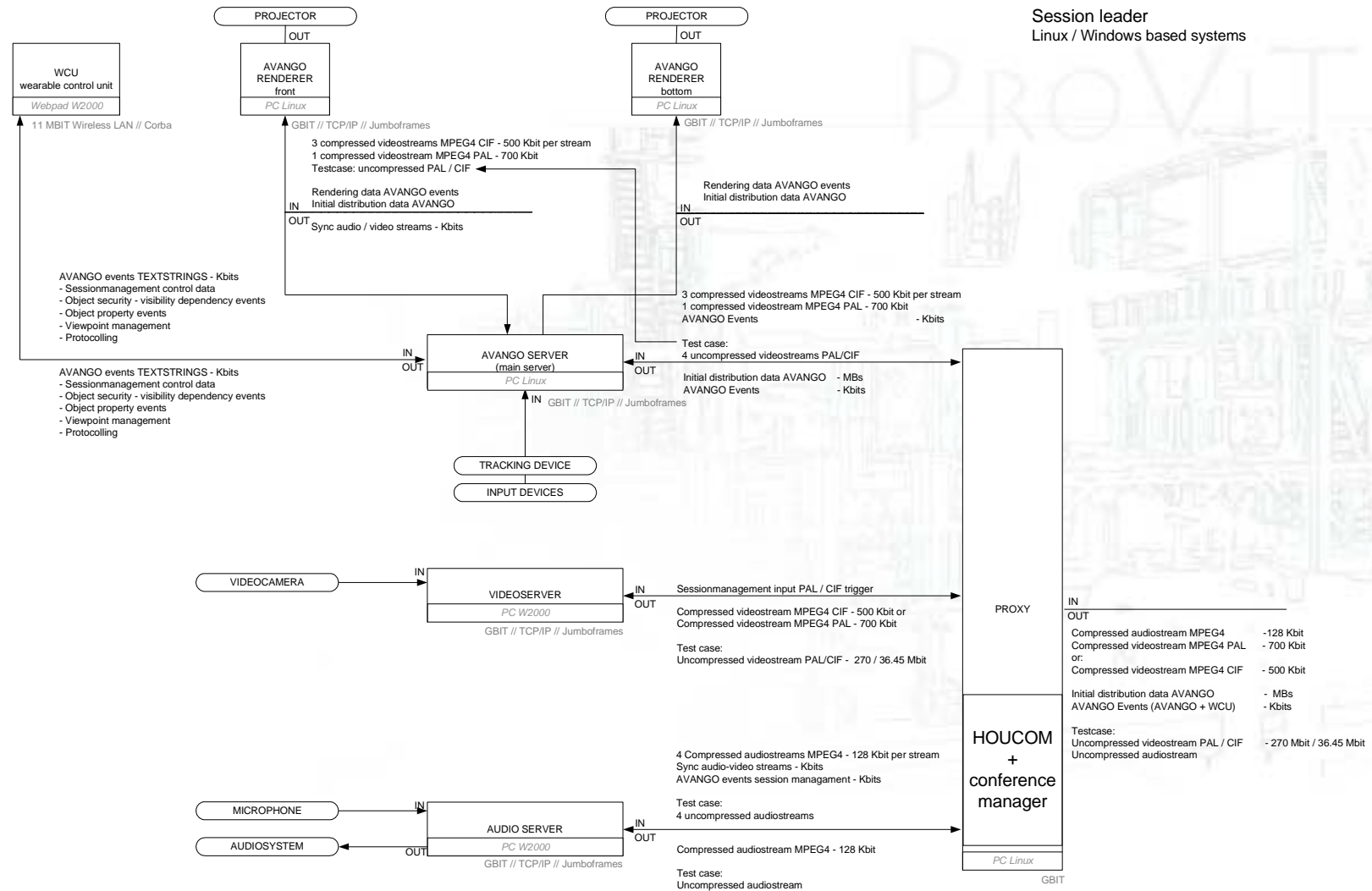
- Interactively work on visualised, shared data through immersive virtual environments
- Apply physical simulation
- Discuss problem areas by using direct audio-visual communication

Throughout the project, the partners maintain in close contact with the industry to ensure practical applicability of the product.

# System architecture

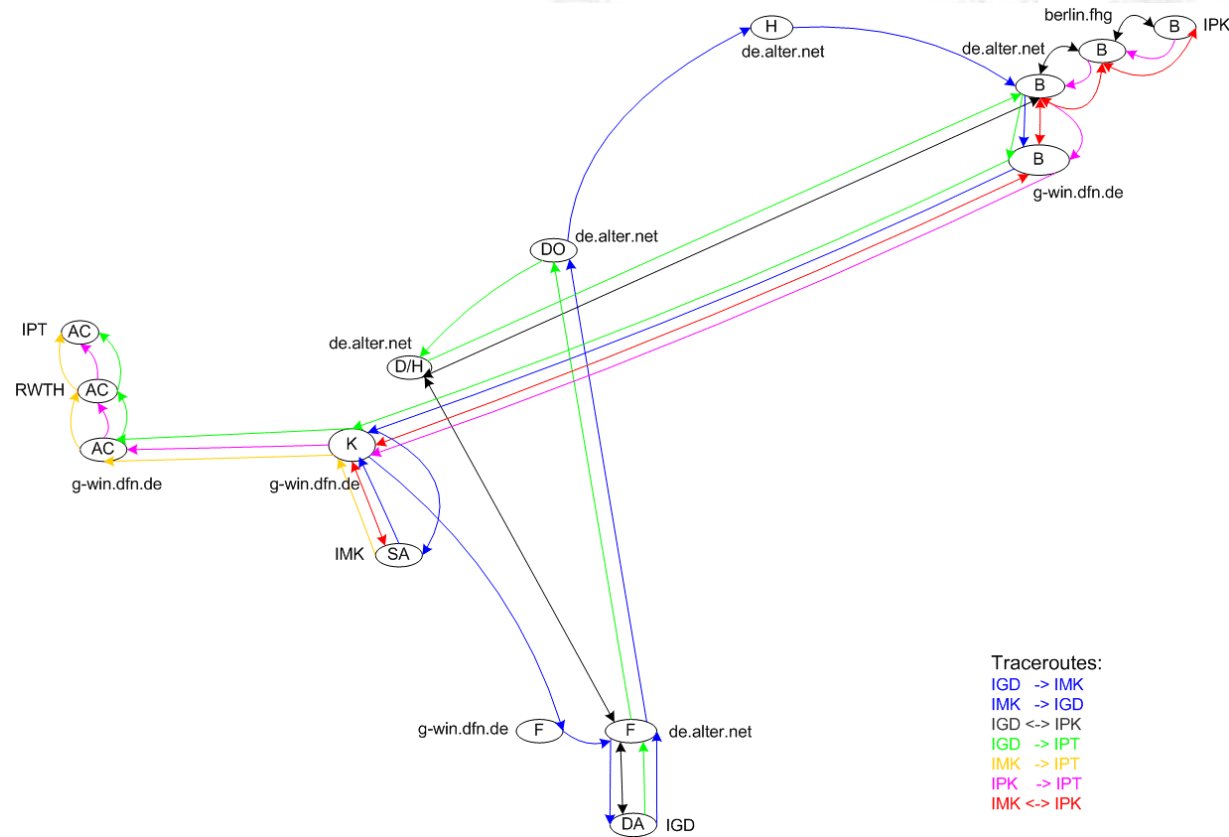


# Complexity of data streams



# Network issues

- Usage of high-bandwidth networks locally, future usage of dark fiber networks between Aachen, Darmstadt and St. Augustin are under discussion (Rephonet).



# AVANGO

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Wearable Control Unit for improved interaction in Virtual Environments

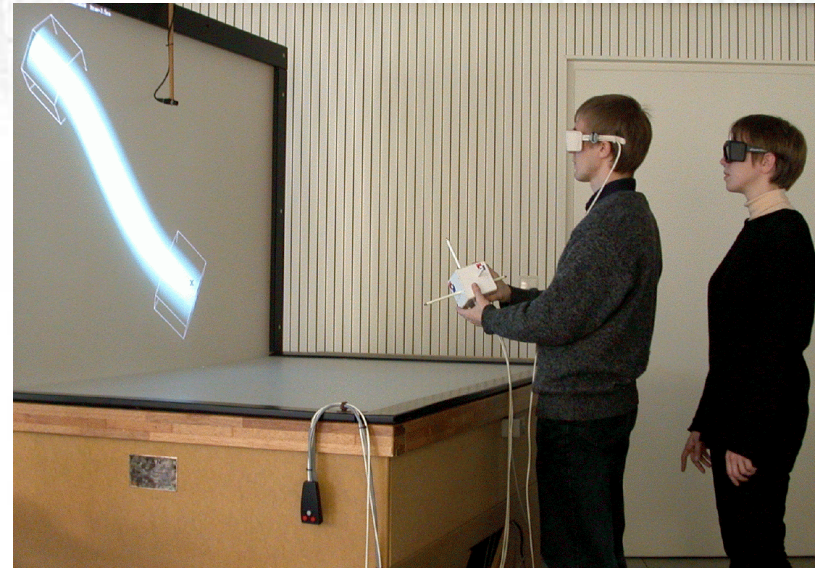
- AVANGO is used to integrate the immersive components of the project:
- Optimized distribution of large data sets.
- Realizes interactive 3D visualisation at L-shape displays
- Allows cooperative work on scenegraphs
- Supports novel interaction methods, like integrated 2D and 3D interaction via Wearable Control Unit

avango

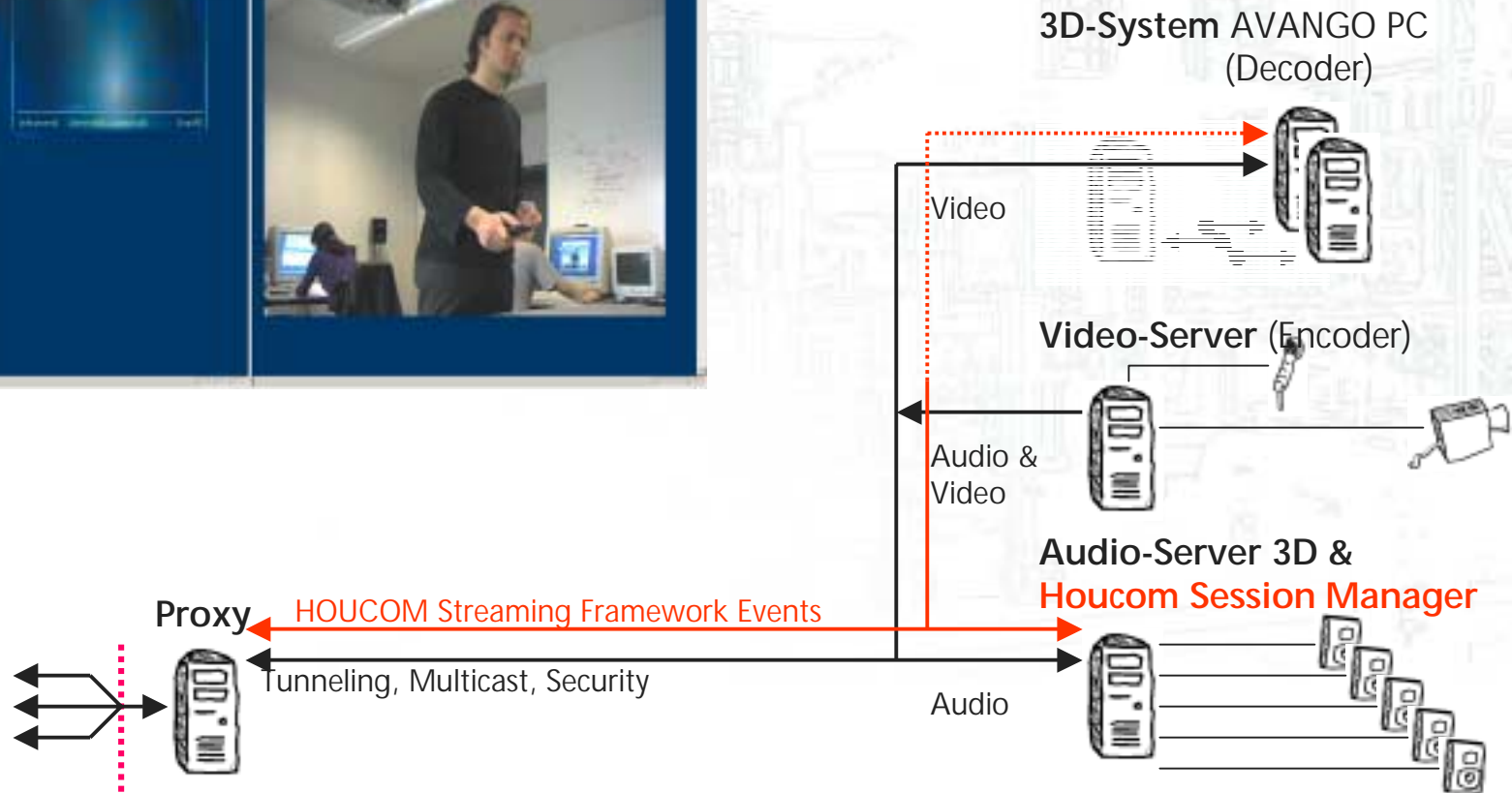
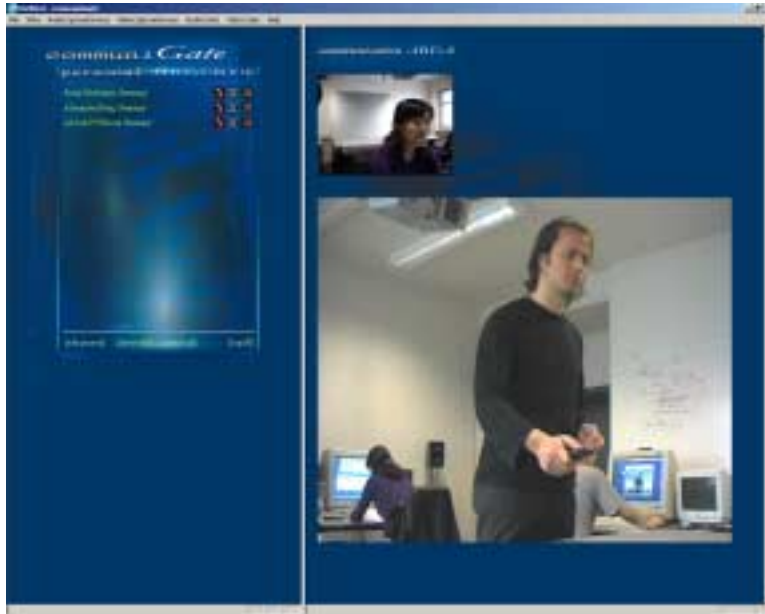
# Simulation of elastic and rigid machinery parts

- Physical based simulation is used in the machinery scenario to allow close-to-reality montage of parts, like tubes.
- Linear and non-linear simulation methods are tested

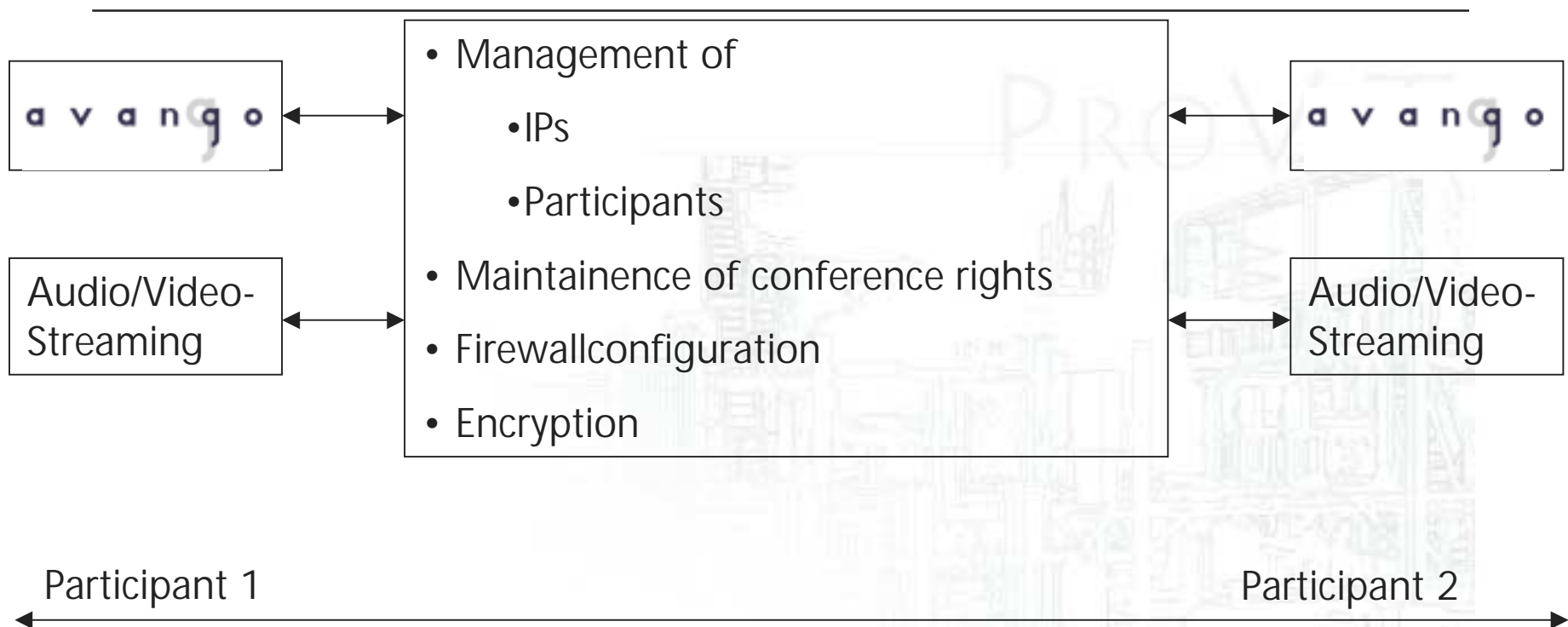
*Non linear simulation of a flexible tube  
(Dr. Nikitin, IMK)*



# Audio-/Video-Streaming



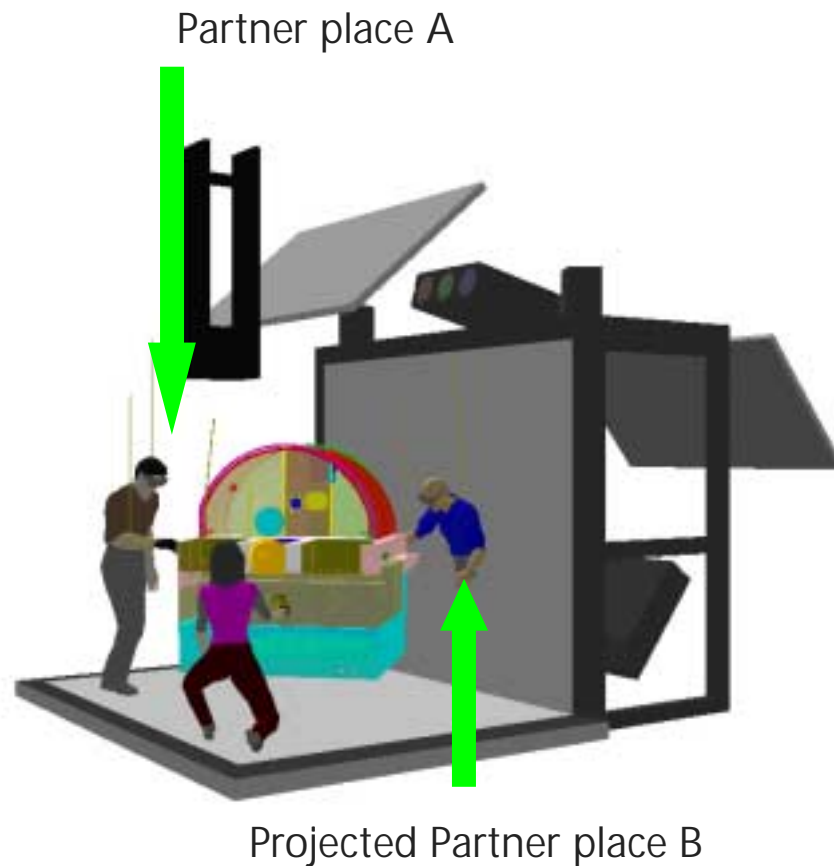
# Conference management system



## Goals of the conference management system

- Improvement of integration with available IT-infrastructure (Networks, Firewalls),
- Integration of network and data security mechanisms,
- Optimization of security through conference rights management of users
- Ergonomical improvement for users and administrators.

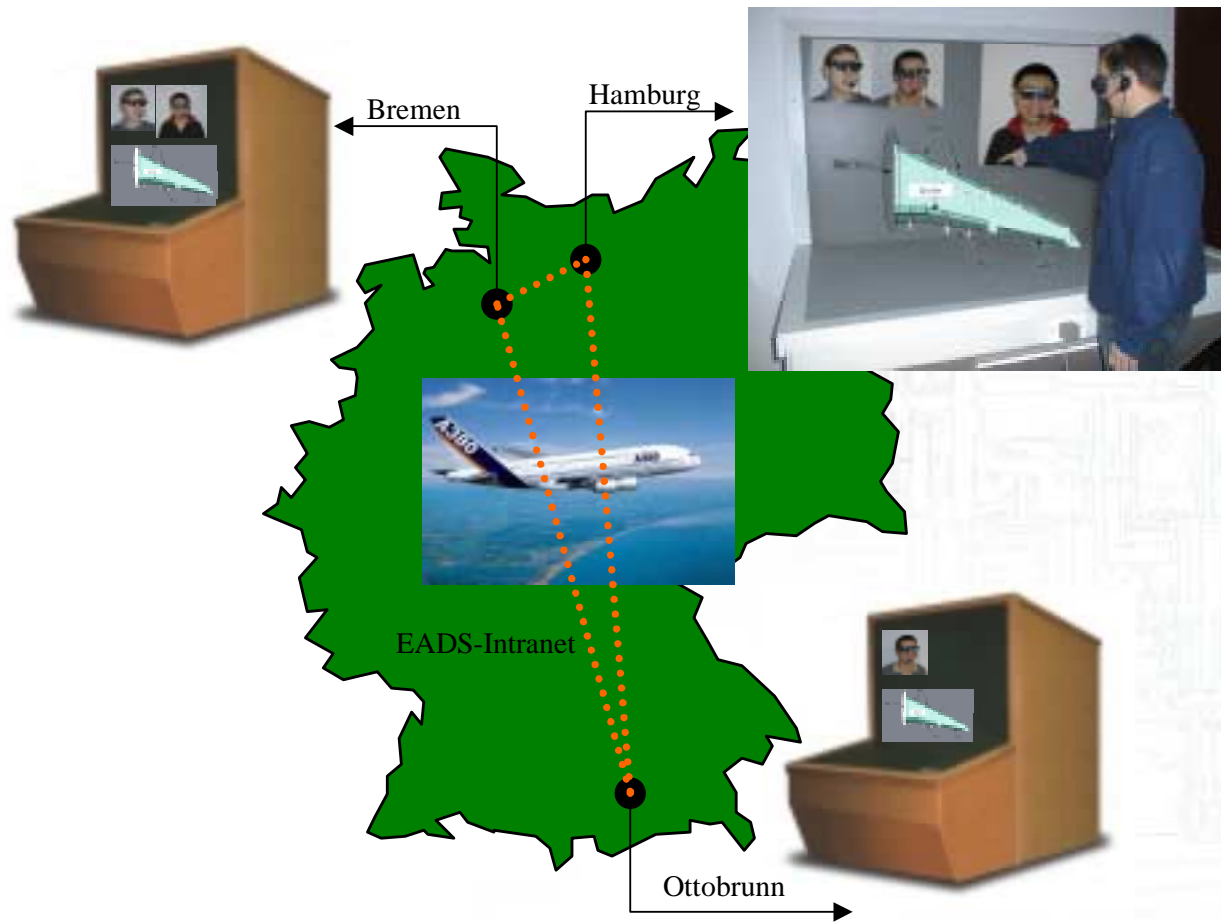
# Scenario machinery design



- In the immersive teleconference, a user, machine manufacturer, control designer and supplier cooperate.
- Goal of the conference is, among others, to compare different machine alternatives, the planning of flexible parts within the machine, like rubber tubes

*Image: Fraunhofer IPT*

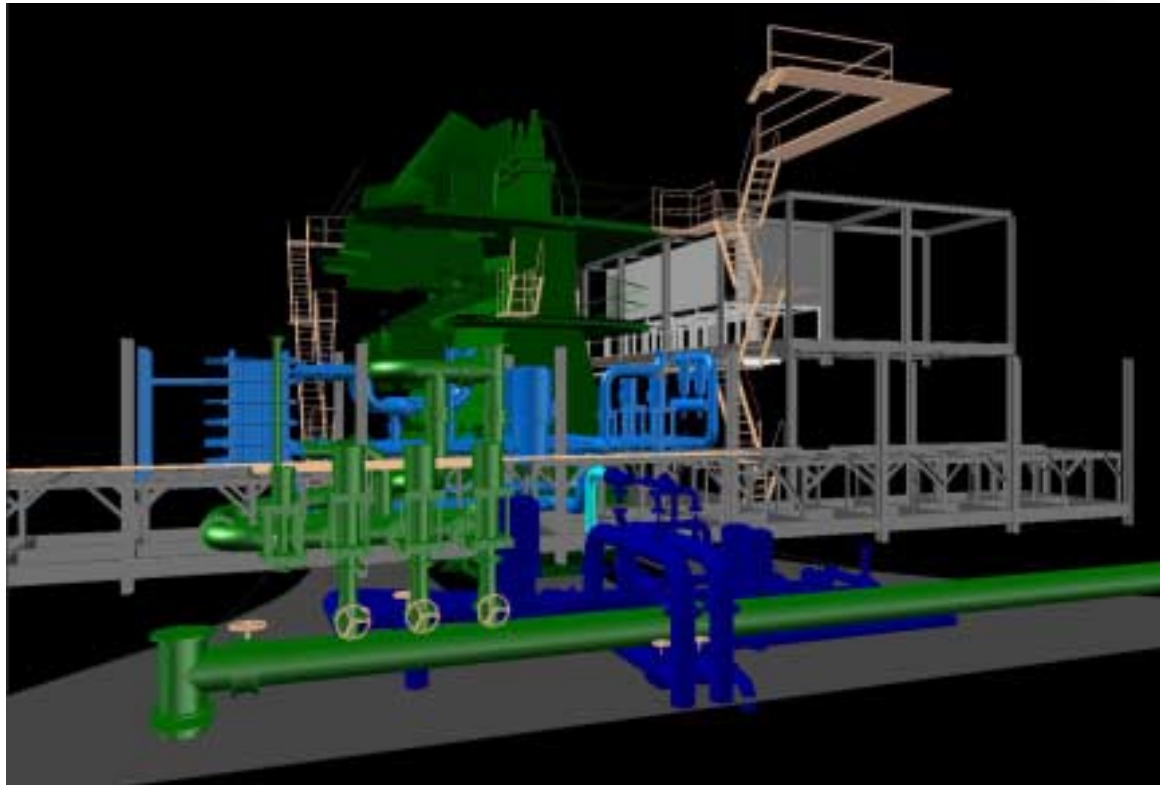
# Scenario airplane design



- Airplane manufacturer and two suppliers take place in a immersive teleconference session
- Goal of the conference is the visualisation of separate models, aiming at collision detection
- Solutions to problem detections are discussed
- Session is protocolized to allow management of work.

# Scenario ship design

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*Main engine, image ZGDV.*

- A ship manufacturer, an engine and an aggregate manufacturer take place in an immersive review.
- Goals of the review are the comparison of different models, the checking of integration of building parts, and the placement of cables and channels.
- During the review, the sizes of different parts are defined to allow optimal placement.

# Summary

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- ProViT.....
  - aims at supplying an immersive telepresence system for design review in machinery, airplane and ship design
  - shows close cooperation with industry: low-cost systems and high-end systems are in use to explore full range of possibilities
  - explores new methods in the field of distributed VR, immersive conferencing, interaction, session management, and physical simulation
  - applies full range of network bandwidths, up to gigabit networks
  - already receives great attention from industry after „first impressions“ of the intermediate system

# Q's & A's

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Thanks for your attention!

*Any questions?*

