The Multimedia Home Space, MHS, can be any room in a single family house or an apartment. MHS can be a specialized room, built for near-natural virtual collaboration, or it can be the living room or kitchen. The ‘Virtual Dinner’ described below typically takes place in the kitchen or dining room, while the ‘Interactive Futuristic Movie’ probably takes place in the specialized room. From those spaces the users can participate in any networked or local collaboration, private or public, with other people, or with servers.

The living room
All walls, the ceiling and the floor should ideally be stereoscopic multiview screens, see Figure 4-1. Sofas, chairs, boards and cupboards probably will not disappear. But physical books and book shelves, paintings, photos, curtains, lamps, ornamentation in the ceiling, TV, PC, collaboration equipment, can be provided by the screens. Various user interfaces to services and house equipment (heating, cooling, refrigerator, etc, can be touch-sensitive parts of the wall screens. Or, you can of course use remote controls or just speech commands.

When you want to read a book, you may have a stereoscopic projection of the bookshelf and books, and you touch a book, and your ‘virtual-book device’ is automatically loaded with the books content. The virtual-book device can be read exactly as a normal book today, it has physical pages as today, but each page can be loaded with selectable content. Several pages can be spread out on a table. Hyperlinks in the books can be used to fetch more information (like web-pages) and displayed on the surfaces in the room.

The appearance of the room can be changed any time. If you want a big décor in the ceiling, you just load it. If you want green walls and a white ceiling one day, and read walls another day, you can have it. If you want a blue sunny sky, you just project that in the ceiling, and mountains on the walls. Paintings by Rembrandt, Munch, or other can be displayed. New computer generated art works can be viewed in stereo.

Lighting can be handled by the screens. If you like you can display various types of light sources, placed in any position.
The perceived size of the room varies with what you display on the walls or ceiling. If you want a small room, just project (stereoscopic) walls nearer you that the physical walls.

The windows in the house can today give you different views. MHS will give you panoramic views around your house, just by electronically making the whole wall transparent towards the fjord or mountains (like a one-way mirror). This wall can in addition either reflect the heat from the sun on hot days, or absorb the radiation for internal heating on cold days. If the views around your house are boring, you can of course use artificial views.

You may want to set up a virtual visit to your old mother. She can be ‘placed’ in your (real) sofa just in front of you. You may even have a virtual discussion on the theory of relativity with Albert Einstein (if Einstein is properly modeled as an expert humanoid).

Service providers start selling online varying room appearances: ‘On Fridays I want paintings of van Gogh, on Saturdays from 10-12 I want live pictures from the Piazza dei Signori’.

Example, a Virtual Dinner Scenario
Researcher A in Trondheim enters his dining room, sits down in his sofa and requests a Virtual Dinner with researcher B in Padova, also sitting in his sofa. This interaction generates different levels of traffic from A sent to B. The system ‘finds’ two faces and a plate with food for researcher B. A and B talk for about 30 s (7 Gbps), then researcher A arises (0.5-1 s), goes out for a plate of food (5-10 s), is out (1-2 min), comes in again (5-10 s), and sits down (0.5-2 s), increasing traffic to nearly 60 Gbps, which then drops to the background of 127 Mbps. The system tracks the plate and the food. They start eating and talking, and the face, arms & hands, and plate & food dominates the data rate, about 8 Gbps. Researcher B stands up and walks sideways the room. After a few minutes they need to talk to researcher C in Poznan, and set up a three party DMP. After eating, B leaves the room. A asks the system to disconnect B. Researcher C has to leave home and go to his office. But he wants to continue the session with A while traveling to the office.

The play room
The Item Experts in Team, Village 24, 2006 [EIT06], with the author as the problem owner and Village professor, presented four proposals for how the Multimedia Home Space (MHS) should look like in 2016. Some requirements were given. The MHS shall be a network based multimedia system, and the perceived quality shall be ‘near-natural’, or near-real. The four proposals are shortly described below. The requirement to the play room is much the same as of the living room, but in addition, physical simulators, physical ‘downhill’ and ‘uphill’, and realistic input devices (haptic) should be provided.

The proposal from group 1 was called VvV (Virtual real Reality, translated from Norwegian, Virtuell virkelig Virkelighet), and assumes a spherical space where advanced AV technology can give users new experiences. The VvV sphere can be applied in many activities, such as interactive multiplayer games, virtual travels, work collaborations, education, remote surgery, and general education. The VvV sphere
shall provide stereoscopic multi-view for all viewer positions. The system cannot be realized by existing networks and existing technology. Data rate of Gbps are required between users, and the quality of shooting and presentation equipment has to be improved dramatically compared with existing equipment.

Group 2 looked into how to realize the home environment for distributed poker playing. A large, flat screen with lenticular multiview 3D and ultra high resolution is used together with a touch-sensitive 3D screen placed on a table, where poker cards or other can be shown. High-quality 12.1 sound is needed. Present technology is not advanced enough to build such a system, but in ten years it should be possible.

Figure 4-1. All surfaces in the room are stereoscopic multiview projection screens.

SINDI, Sensual and Interactive almost Natural Dating environment, was the title of the project of group 3. The group ended up with using Virtual Retinal Display or other types of Head Mounted Displays. Virtual physical contact can be provided by haptic
techniques with force feedback, but the present quality is still far from satisfying the group’s requirements.

Group 4 tested networked musical collaborations, and found the perceived quality to be varying with genre, degree of improvisations, the ensemble composition, and the player’s musical level.