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Dynamic Voice Communication Support for Multiplayer Online Games

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ABSTRACT
Voice communication has become an important part of interaction between players in many Multiplayer Online Games (MOGs). Successful team play depends on fast perception of and adaptation to the opponent's actions. Current voice communication tools utilize a single chat room for all team members. However several tactical situations require communication within sub groups which would interfere with other important group communication. There is a need to provide parallel dynamic communication to support current MOG scenarios demanding hierarchical grouping, increasing group sizes and handling of tactical as well as rapidly changing situations. We have developed a concept to support dynamic voice communication and implemented a tool to support communication in different game situations. Our solution supports template based pre-planning, adaptation to different game situations in real time and is easily pluggable on existing voice communication tools.

Categories and Subject Descriptors
H.4.3 [**Information Systems Applications**]: Communication Applications – *Computer conferencing, teleconferencing and videoconferencing;*
H.5.3 [**Information Interfaces and Presentation**]: Group and Organization Interfaces – *Computer-supported cooperative work;*
K.8.0 [**Personal Computing**]: General – *Games.*

General Terms
Management, Design, Human Factors.

Keywords
Networked gaming, voice communication, context awareness.

1. INTRODUCTION
Team play is an integral part of Multiplayer Online Games (MOGs) and one of the main incentives for players. The competition of players against other players as well as challenges like the collaborative defeat of mighty computer controlled characters require teamwork which results in the formation of groups. In groups the coordination of team members, strategies including tactics for different situations and skill based distribution of duties and responsibilities is required. For larger groups partitioning into sub groups is needed. Fast reaction to an opponent's actions and the game situation is essential. The actions of the team members in the groups and sub groups have to be arranged, status updates need to be given to the team coordinators and commands have to be issued. Different game situations demand different combinations of team members. Thus the resulting structure of a team is not fixed and can change dynamically. Voice communication tools are used to support team play. Their main advantage is that they provide instant, synchronous communication without interfering with the control of the game character.

We propose a concept using templates and ingame information for planning dynamic group partitioning to enable parallel and dynamic voice communication for MOGs. As a proof of concept we have implemented a communication configuration tool using an existing voice communication tool to enable strategy planning and dynamic communication.

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2. DYNAMIC VOICE COMMUNICATION
Our concept enables multi group voice communication and highly dynamical adaptation to the communication needs of tactical team play in MOGs by providing multiple independent communication channels. We introduce a template based approach for configuration of these communication channels, where each template maps to a different game situation. During a game, different templates can be used.

The dynamic template concept is based on the players' roles. The roles are essential for the organisation of team play within the groups. There are two different types of roles which have to be considered. In all multiplayer team games there are meta roles for management and coordination of a group, which are independent of a players character. Several different roles can be taken by one player. Most meta roles are game independent. There are e.g. coordinators for groups and sub groups (team leader) and reporters for status updates. Depending on the game situation, the roles can collate into a few or just one player. Additionally a player's character has certain abilities which conclude in a character role he can fulfil. The character roles are game dependent but can be classified regarding the different genres of MOGs. Those character roles are an integral part of the games and have a high impact on team play. Character classes imply the possible character roles characters are able to comply (e.g. short range damage dealer, long range damage dealer, controller and supporter). At any rate the roles can change dynamically

depending on the game situation, but they are limited to a certain set. To support team play of groups in MOGs by a voice communication tool those aspects have to be considered.

This implies requirements for voice communication tools supporting MOGs. These are support of a hierarchy of members, adaptation of communication regarding dynamic change of situations and integration into the game or providing overlay functionality for the visualisation. Members of groups and sub groups have to be able to speak in parallel and certain members need special rights to speak, e.g. someone who can talk to and hear all members. Recent voice communication tools used for gaming only meet a subset of these requirements. Only static chat channels are supported and simultaneously speaking players become very difficult to understand. A dynamic adaptation of the communication to the game situation is not supported. Other approaches (e.g. [1],[2],[3] which enhance voice communication take a connection of the game and the voice communication tool as granted. It is not discussed how such a connection can be established. However no interface exists to connect voice communication tools to a MOG. We propose to use the Virtual Context Based Services (VCBS) [4] to enable the utilisation of ingame information in voice communication tools.

3. IMPLEMENTATION

As a proof of concept we have implemented a team leader pre-planning and control tool on top of mumble, an open source voice communication system for gamers. We call the tool Communication Configuration Tool (CCT.KOM). Game voice communication tools like Mumble [5] or Teamspeak2 [6] are client/server architectures. Each user connects with his voice client to the voice server. The client provides a UI for connecting to and switching the static server voice channels. Each user can mute other users. All three voice communication tools mix audio streams on the client side using sound hardware. This leads to a straight forward integration of our concept by defining a control interface for remote control of voice servers. We implement an interface for the mumble server in order to connect the CCT.KOM to it. Figure 7 shows that our architecture is loosely coupled to the voice communication tool itself and can be applied to any client/server voice tool, even if it is integrated into the game.

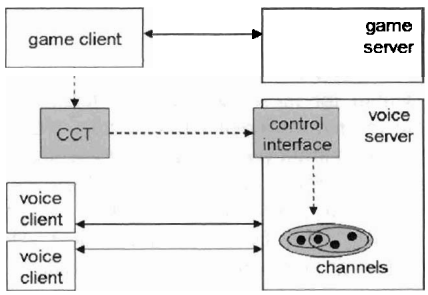

Figure 7: Architecture and Integration of the CCT.KOM

Additionally the architecture allows for the CCT.KOM to be connected or integrated directly into the game client. The voice clients remain unchanged and only the team and sub team leaders need a CCT.KOM to control the configuration of the server. In a pre-planning phase the team leader defines templates, where roles are distributed to groups. After that he defines a sequence of templates which maps the chosen strategy and saves it for the event. After the game event he can easily modify the templates to improve the communication for future events. We have implemented a control view so that the team leader can observe the current assignment of players, roles and groups.

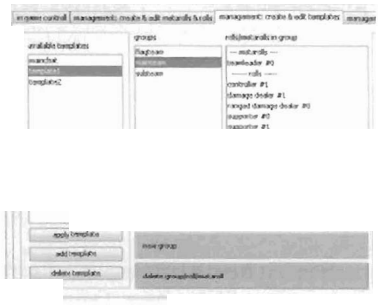

Figure 8: Template creation view of the CCT.KOM

Figure 8 shows the template creation view of the CCT.KOM. Using the meta roles and character roles, templates for different tactical situations can be defined.

4. CONCLUSION

Without team play, requiring planning and strategies a great deal of goals in MOGs cannot be achieved. Currently voice communication tools do not support dynamic game situations where players are grouped together in order to solve parallel tasks. We present an approach for parallel and dynamic voice communication. To manage the communication channels we use templates and ingame information. CCT.KOM provides pre-planning and control of voice communication. As a proof of concept we modified the open source voice communication tool Mumble.

Our next steps are the integration of the CCT.KOM UI into a MOG and the utilization of ingame information by coupling the CCT.KOM with the VCBS architecture. Ingame information can be used to automatically switch the templates. This improves the reaction to game situation changes and the support of team leaders.

5. REFERENCES

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