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Towards Quality of Experience in Advanced Collaborative Environments

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Goal:

To maximize the Quality of Experience (QoE) for the end user of a distributed, collaborative environment, regardless of the technologies available to that user



Barriers to the use of ACE

Lack of understanding of the task

- What the user is trying to do

Lack of understanding of needs

- What is required to accomplish the task

Complexity of ACE

- Needs of collaboration are complex
 - Services and technologies are complex to manage
 - Collaboration exists in a dynamic environment

Monolithic collaboration environments

- Widespread adoption requires easy access to collaboration
- Heterogeneity should be supported

Achieving quality in ACE

- Managing complexity to achieve quality

Quality of Experience

What is QoE?

The characteristics of the sensations, perceptions, and opinions of people as they interact with other collaborators

- Measure of human experience, not technology
- The “touchy-feely” part of collaboration
 - Pleasing and enjoyable VS displeasing and frustrating
- *User satisfaction requires a good experience!*

QoE and ACE

Overcoming the Barriers

The ACE domains

- The task domain
 - What is the user trying to accomplish?
- The needs domain
 - What does the user require to accomplish the task?
- The services domain
 - What services meet the task needs?
- The technology domain
 - What technologies are available for collaboration?

Providing QoE

- Tasks and needs define requirements
- Requirements define:
 - The services that are chosen
 - How the services are deployed on technology

The Task/Needs Matrix

- Task are rows, needs are columns
- Five major task classes
 - Meetings, collaborative work, education, presence, entertainment
 - Classes are subdivided as required
 - Meetings subdivided on size, formality, familiarity
- Extensible set of needs
 - Auditory, visual, AV sync, workspace, presentation, 3D visualization...
 - Each need has a set of characteristics
 - Audio: latency, fidelity, reliability
 - Workspace: textual, visual
 - Needs are ranked in importance for each task
 - Characteristics are given values that map to service quality

Tasks and Needs

Creating the Matrix

Creating the Tasks/Needs Matrix

- Where they exist, research findings (CSCW, HCI) have been used
- Use the matrix to define gaps in the research
 - Guide us in further refinement of the matrix
 - Guide further research to populate the matrix

Work session:

Please specify if this will be a large (more than five participants) or small (five or less participants) session:

Small
 Large

Please specify if this session will be formal or informal:

Formal
 Informal

Please specify if the participants are familiar with each other or if they are strangers:

Familiar
 Strangers

Determining the task: the task wizard

- Users asked questions about their goals
- Answers identify a task row in the matrix
- Matrix row identifies the needs for that task



Task	Auditory	Visual	AV Sync	Workspace	Presentation
Large, informal, colleagues	10	9	5	5	7

Services and Technologies

Tasks and Needs

- The requirements for the collaboration

Services and Technologies

- Delivering the collaboration

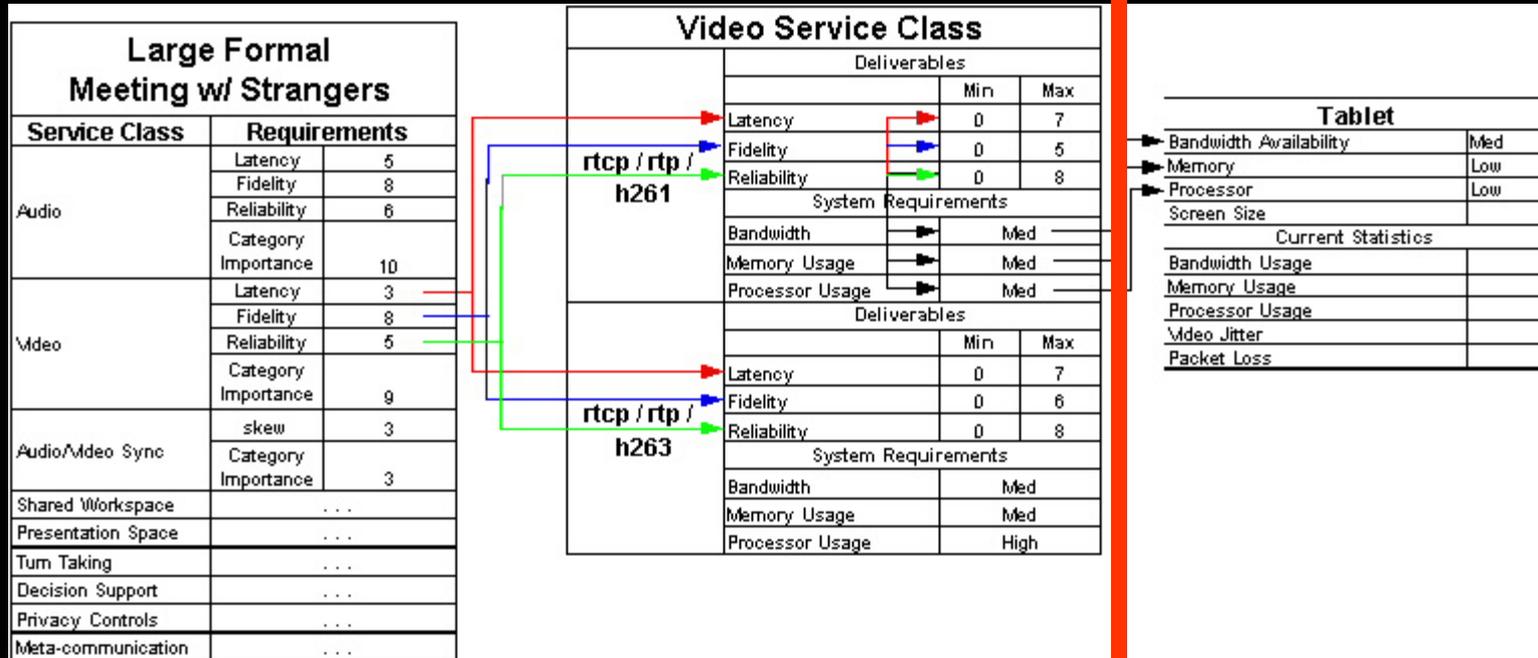
The ACE data model

- Bridges the gaps between
 - Needs and services
 - Services and technologies
- The components of the collaboration environment
 - Tasks, needs, sessions, services, nodes, users
- The relationships between relevant entities
 - Tasks have needs and needs are met by services
 - Sessions carry out tasks and require services
 - Nodes perform services and provide access to users

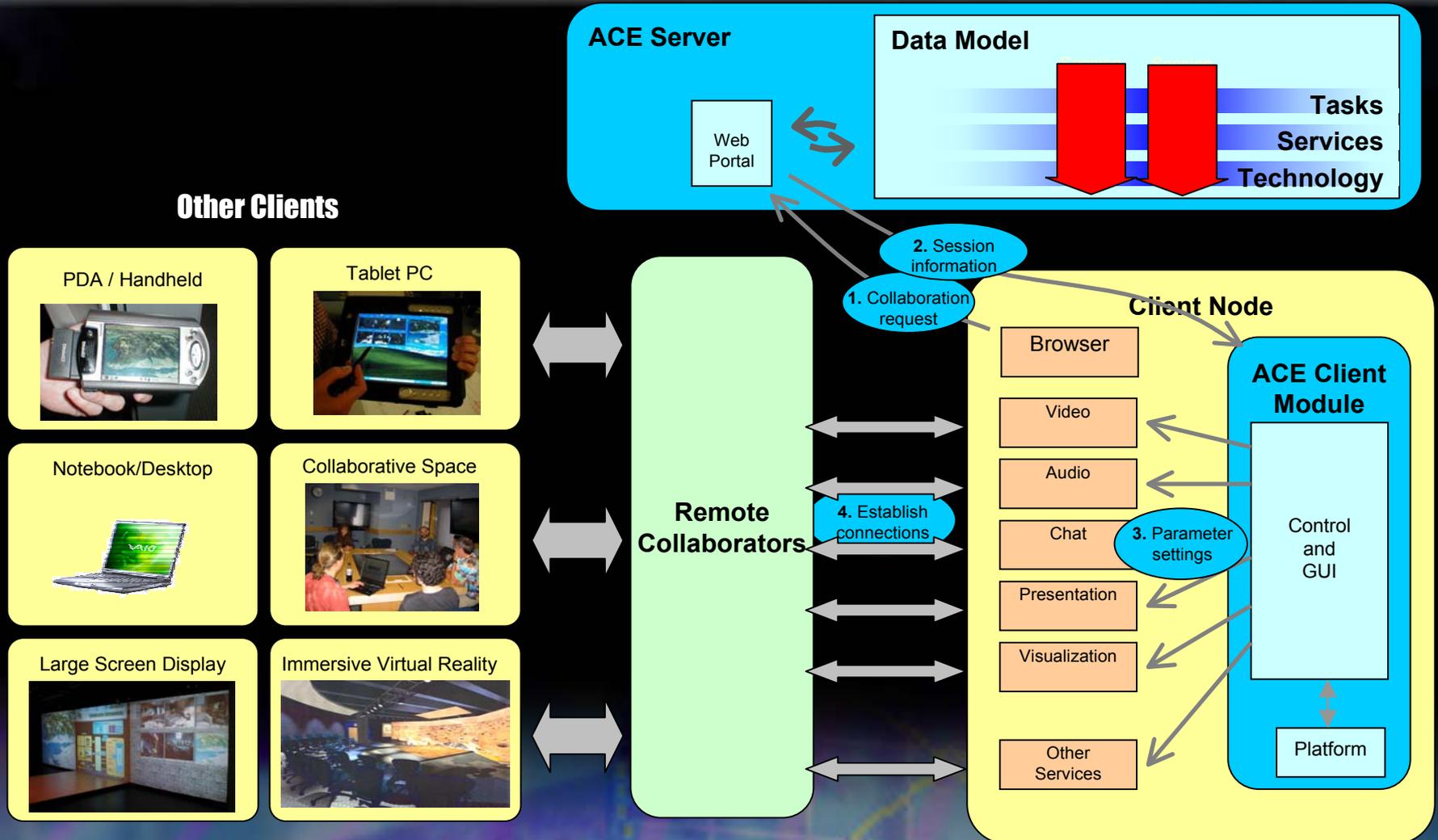
Services and Technologies From Task to Technology

← Session creation

Runtime →



A QoE Based ACE



Expansion of our current system

- More sophisticated task wizard
- More sophisticated QoE decision process
- More intelligent QoE based session instantiation

Exploring agent based architectures

- Distributed data model
- Agents represent entities in the data model

Advanced collaboration services

- Adaptive QoE aware services
- Advanced interaction capabilities (table and wall displays, touch and gesture interaction)

QoE ACE deployment

- WestGrid grid computing initiative in Western Canada



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That's all folks...