



# *Multimedia Protocols Project*

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## *Multimedia Project Goals*

- ◆ **Facilitate the emergence of scaleable teleconferencing technologies**
- ◆ **Promote the use of standards in multimedia communications area.**
- ◆ **Perform research necessary to improve current standards and recommendations in multimedia communications.**
- ◆ **Document and publish research results.**



## *Multimedia Project Research*

- ◆ **Concentration on the International Telecommunications Union T.120 proposed standards for multimedia communications.**
- ◆ **Specifically on Multipoint Communications Service (T.122, T.125) and its underlying transport stacks (T.123).**



## *Research Approach*

- ◆ **Multipoint Communication Service over native multicast network.**
- ◆ **Investigate possible next generation of MCS considering native multicast networks.**
- ◆ **Propose alterations to ITU standards with regard to multimedia communications over multicast networks.**



## *Current Project*

- ◆ **Establish a multimedia laboratory environment: including software and hardware components for video conferencing.**
- ◆ **Multipoint Communication Service over Reliable Multicast Protocol via Convergence Layer Protocol.**



# *Convergence Layer: MCS over Multicast*

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## *Objective*

- ◆ **Allow MCS to use native multicast services, where available.**
- ◆ **Preserve interoperability with MCS implementations which do not support multicast.**



## *Convergence Layer*

- ◆ **Determines whether peer MCUs are multicast capable.**
- ◆ **Maps service primitives between MCS and multicast and/or point to point stacks.**

Multipoint Communication Service

Point to Point/Multicast Convergence  
Layer

Reliable Multicast  
Protocol (RMP)

Point-to-Point  
Transport

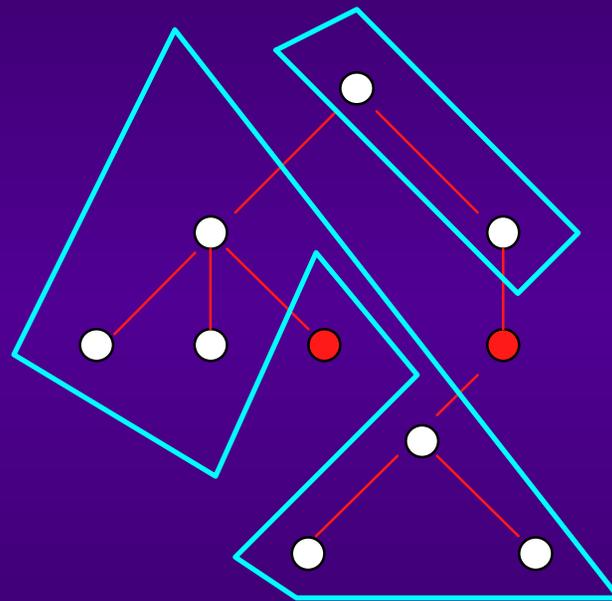


## *Choices in Providing Multicast*

- ◆ **Multicast addresses shared among MCUs not directly connected in the MCS domain.**
- ◆ **Multicast addresses only shared by an MCU and its immediate subordinates in the domain tree.**



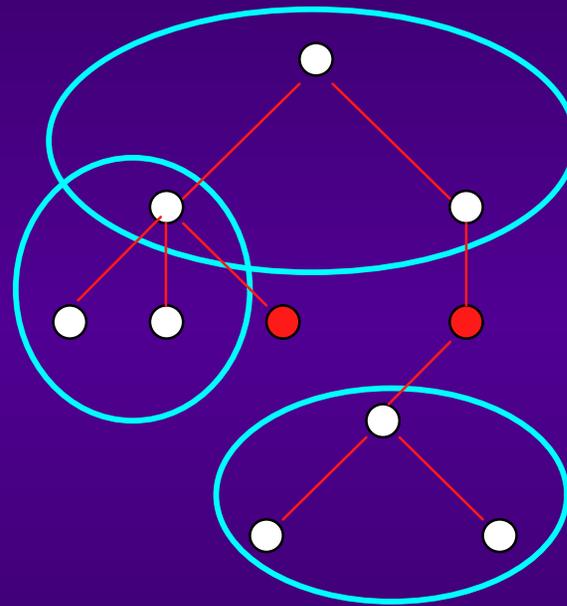
# General Multicast Group Structure



- Multicast nodes
- Non-multicast nodes
- MCS connections
- Possible extent of multicast groups



# *Restricted Multicast Group Structure*



- Multicast nodes
- Non-multicast nodes
- MCS connections
- Possible extent of multicast group



## *Restricted Multicast Group Structure*

- ◆ **Addresses are only one level deep - between an MCU and its immediate subordinate.**
- ◆ **Multicast Address assignment is dynamic.**
- ◆ **Multicast Addresses correspond to MCS channels.**



## *Convergence Layer Protocol*

- ◆ **Service Primitives exchanged between MCS and the CL are based on the interface defined in T.123.**
- ◆ **CL Protocol Data Units defined for communication between peer entities.**



## *Convergence Layer Behavior*

- ◆ **Connection Phase**
- ◆ **Channel/Multicast Group Management**
- ◆ **Channel Data Transfer**



## *CL Connection Phase*

- ◆ **If peer is multicast capable then CL indicates that a connection is established.**
- ◆ **If peer is not multicast capable or refuses multicast operations, then CL reverts to point to point Transport class 0 operations and acts as pass through layer.**



## *CL Channel Management*

- ◆ **Multicast groups are used to send data downward to an MCU's immediate subordinate.**
- ◆ **Every channel used by an MCU to route data downward is mapped onto a separate multicast address.**



## *CL Channel Data Transfer*

- ◆ **When acting in a multicast mode, CL “filters out” redundant data transfer requests made by the MCU.**
- ◆ **CL only broadcasts data when MCS sends data to a predetermined “trigger” endpoint.**



## *Draft Design Specification*

- ◆ **Defines Convergence Layer protocol behavior.**
- ◆ **Establishes a mapping between point to point services and a multicast service (RMP)**
- ◆ **Preserves interoperability with existing MCS implementations.**