

WWW

MHEG

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MHEG based Distance Learning/Training System on WWW

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MHEG

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MHEG

Abstract

In this paper, we design distance learning/training system on distributed environment. It is based on MHEG. Unlike traditional systems that provide courseware and individual learning by asynchronous browsing methods, we design it to support both of synchronous and asynchronous learning for enlarging educational effects. Especially, in synchronous mode, session management module can supply multi-user collaboration environments. It provides operations for students and session control in some applications such as real-time video lecturing, so it can enhance educational effects. Using MHEG standard, it can supports real-time user interaction facility, also it can maximize supporting ability for computer based training.

1.

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/ [1]. / 가 가

[2, 3, 4].

HTML / 가 WWW WWW
HTML

[5]. ,

[4].

MHEG . ISO/IEC JTC1/SC29/WG12 MHEG(Multimedia and Hypermedia
information coding Expert Group)

MHEG / [6]. MHEG-5
TV, MHEG

[7]. MHEG-5
ASN.1(Abstract Syntax Notation One) 가 .
가 , MHEG-5
가 ,

[8].

MHEG /

. MHEG-5 [9] /

MHEG / 가
가 . MHEG Java ,
C++ .

2. WWW

WWW

2.1

가 , 가
가 ,
[10]. 가 ,
가 ,

가
(unicast),

(broadcast),
(multicast) [11, 12].

가

2.2 WWW

WWW

[5].

WWW 가

WWW

HTML

WWW

[5]. WWW

HTML

CGI, ActiveX

HTML

Java,

WWW

WWW

가 [13, 14].

가

가

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3. MHEG-5

MHEG-5

MHEG-5

3.1 MHEG-5

MHEG-5

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TV,

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MHEG

[7]. MHEG-5

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MHEG-5

ASN.1

BER(Basic Encoding Rule)

. ASN.1

. ASN.1

ASN.1

. ASN.1

ASN.1

. ASN.1 BER , BER MH
MHEG-5 .
MHEG-5 , MHEG-5 MHEG-5
MHEG-5 MHEG-5 [7, 15]. (application)
(scene)
(ingredient) , 가 (event)
MHEG-5 가 , MHEG-5
MHEG-5

2.2 MHEG-5

1 MHEG-5 (textual notation)
MHEG-5

1 MHEG-5

```
{:Application ( 'test/startup.mheg' 0 )           :OrigContent 'MHEG-5
:OnStartUp (                                     :OrigBoxSize 700 256
:TransitionTo (( 'test/home.mheg' 0 ) )         :OrigPosition 10 100
)}                                               .....}
{:Scene                                           {:Text 3
( 'test/home.mheg' 0 )                          :CHook 1
:Items (                                         :OrigContent 'F12
{:Rectangle 1                                   :OrigBoxSize 700 356
:OrigBoxSize 720 576                           :OrigPosition 10 200
.....}                                         .....})
{:Text 2                                         :InputEventReq 3
:Chook 1                                         :SceneCS 720 576}
```

1 home.mheg
startup.mheg OnStartUp 가
home.mheg
home.mheg ,
MHEG-5 (scene)
가

3.3 MHEG-5

MHEG-5 GMD FOKUS
GLUE(GLobal User Endsystem)[15], GLASS(Globally Accessible Services)[16], MAJA(MHEG
Application utilizing Java Applet)[17] GLUE GLASS
/ , TV
(set-top box)
/ , MAJA MHEG DAVIC(Digital Audio

Video Council), DVB(Digital Video Broadcasting)

WWW

PC

MHEG-5

, MHEG

가

4. /

WWW

Java

HTTP

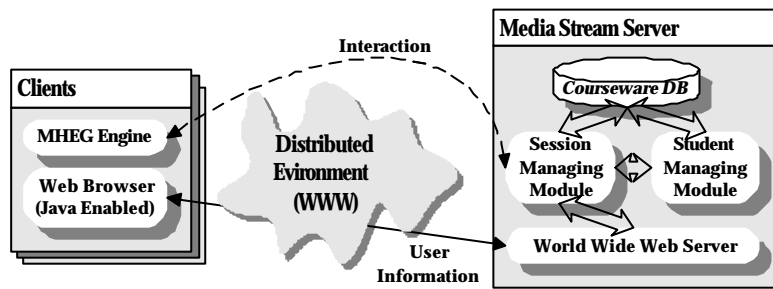
MHEG-5

CAI

. WWW

MHEG-5

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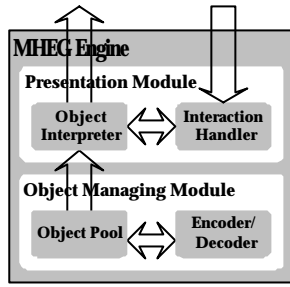
4.1 MHEG-5

MHEG

/

2

MHEG



2 MHEG

4.1.1

[9]. MHEG

BER (octet) 가 MHEG-5 가

BER / MH5Object BER BER 가

MHEG-5 가 MHEG-5 MHEG-5

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4.1.2

MHEG-5 가

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InteractionHandler::RunAction(event)
Begin Method
  aMessage = new MH5Message;
  eventType := event->GetInteractionType;
  aAction := Translate(event);
  actionType := aAction->GetType;
  Case actionType
    Transition : aMessage->Fill(aAction->TargetObjectID);
    Other Action : aMessage->Fill(aAction);
    Otherwise :
      Delete aMessage;
      Invoke Exception Handler;
      Restart;
  End Case;
  Case eventType
    Selection : aMessage->Attach(SelectionType);
    Modification : aMessage->Attach(ModificationType);
  End Case;
  MessageHandler->Send(aMessage);
  Delete aMessage;
  Restart;
End Method;

```

1 MHEG-5

1.

Hypertext		Select or not	Boolean	Real Time
Entry Field		Text String	String	non Real Time
Button	Push	Click or Not	Boolean	Real Time
	Radio	Press or not	Boolean	non Real Time
Hot Spot		X, Y Position	Integer pair	Real Time & non Real Time
Slider		Value	Integer	Real Time

MHEG-5

(link condition)

(link effect)

MHEG-5
(action list)

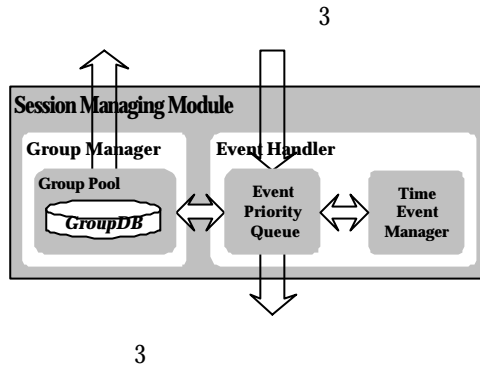
(elementary action)

가

(action size)가

(action target)

4.2



MHEG

MHEG

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2

2

Basic Operations	Create Group
	Destroy Group
Group Management Operations	Join Group
	Leave Group
	Manage Applications
	Manage Time Event
	Control Token
	Manage Group Context
Data Transmission Operation	Support Unicast/Multicast
Information Management Operation	Manage and Retrieve User/Group Information

4.2.1

(consumer)

2

2

EventHandler::Run()

Begin Method

While(not FIFO is Empty)

Read EventData;

If Target is NULL then // Broadcast message type

Retrive ClientIDList from GroupDB with GroupID;

Broadcast EventData to All Members;

Else // Unicast message type

Send EventData to Target;

EndIf

EndWhile

End Method

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4.2.2

(context)

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GroupMember, Inspector 가

GroupChairman

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가

SendMessageToAll

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ID

3

3

GroupManager::ProcessUserRequest(UserRequest)

Begin Method

Case UserRequest

GroupJoin :

User Role is determined by GroupChairman;
Update GroupContext->List;
Send signal to EventHandler;

GroupLeave :

Update GroupContext->List;
Send signal to EventHandler;

RequestToken, FetchToken :

If Requestor is GroupChairman then
Update GroupContext->hasToken;
Send signal to all group members through EventHandler;
EndIf

If Requestor is GroupMember then

Send Message to GroupChairman and the others memebers through EventHandler;

If Requestor is Inspector then Send Deny_Message to Requestor;

GiveToken, ReleaseToken :

Update GroupContext->hasToken;
Send signal to all group members through EventHandler;

GetChairmanInfo, TokenOwnerInfo, GetGroupmemberInfo, GetInspectorInfo :

Send informations to Requestor;

SendMessageToAll :

Send Message and Target Userlist to EventHandler;

End Case;

End Method;

4.3

MHEG

MHEG-5

MHEG-5

MhegDitor[18]

3 4

3

m_studentID	Student Identifier
m_studentName	Student Name
m_password	Login Password
m_history	Learning History till Current
m_current;	Most Recent Node
m_next;	Next Node
m_prevClient	Mode Recent Client

4

m_nodeID	MHEG Identifier for Current Node
m_nodeName	Subject for Current Node
m_headNode	Head Node for Node Management
m_relatedNode	Node List Related to Current Node

m_finishTime	Learning Time for Current Node
m_linkWeight	Weight for Navigation to Related Node
m_weight	Weight for Current Node in Learning

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MHEG

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4 가

StrudentManager::CalcUnderstandingRate(CurrentNode)

Begin Method

URate := 0.0;

aNode := CurrentNode->getFirstRelNode();

While aNode is not NULL Do

URate := URate + CurrentNode->getLinkWeight(aNode) * CurrentNode->getNodeWeight();

aNode = CurrentNode->getNextRelNode();

End While

Return URate;

End Method;

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5.

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MHEG-5

5.1

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(session view)가

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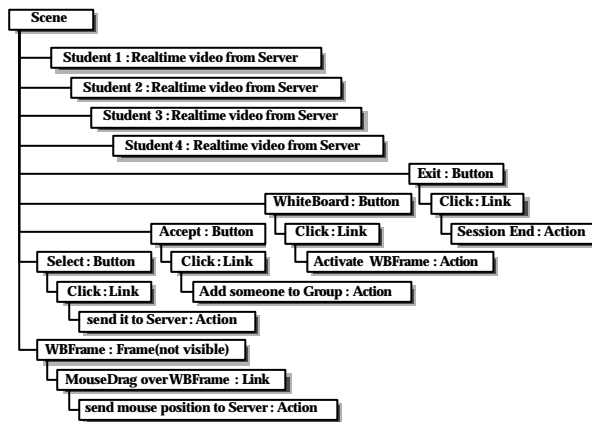
Email

5.2

Libra Media Server, 100base-TX Ethernet TCP/IP
 MS WindowsNT Server 4.0, WWW Internet Information
 Server 4.0 MegaRAID PCI SCSI Disk Array
 25 40MB
 MMX 233MHz PC Windows 95
 MPEG-1 Visual C++ 5.0 JDK1.2beta4, MHEG
 MHEG-5 / [9]
 JMF1.0.2

5.3

1 MHEG
 4 MHEG
 MHEG-5 MhegDitor 1.3 MHEG-5
 MHEG-5 / MHEG
 [9] 4 MHEG
 가



4 MHEG 가

MHEG-5

(textual notation)

ASN.1

ASN.1

MHEG-5

가 *.mheg

Java

MHEG-5

(scene)

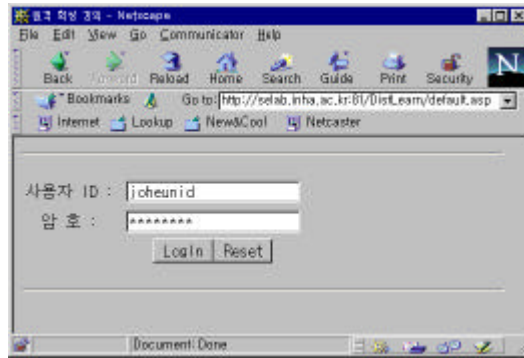
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MHEG-5

5



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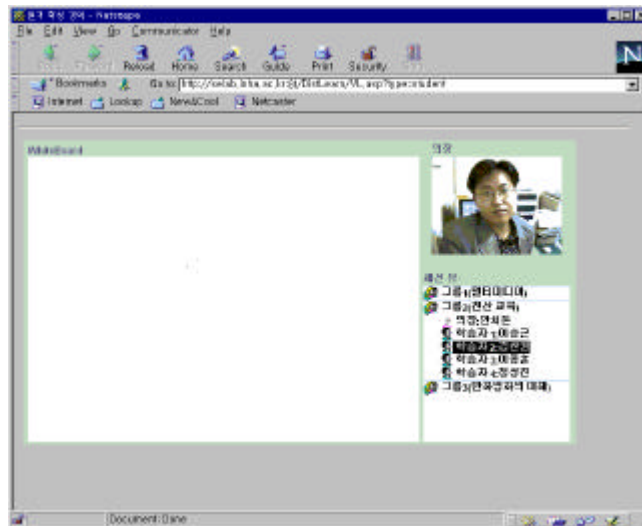
6

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ASP(Active Server Page)

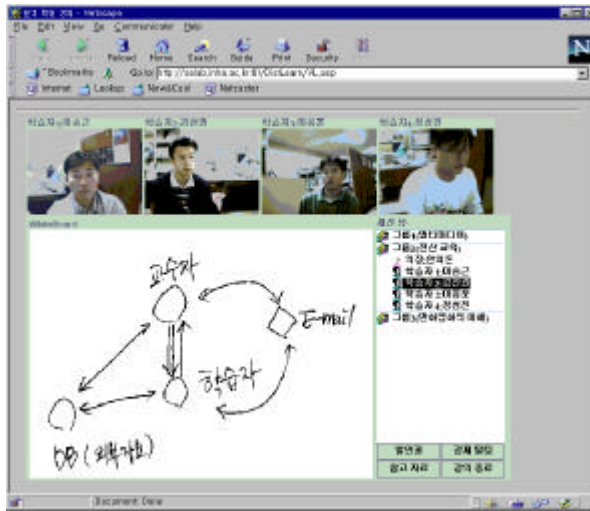
MHEG

MHEG-5



6

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6.

MHEG WWW / MHEG

system) ITS (real-time tutoring
[19] 가 / 가

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