The Analysis of Video Conference
With ITU Standarization (International Telecommunication Union)
That Joining in Inherent
At Bandar Lampung University

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Abstract - *Video conference is an interactive communication device that allows two or more persons can be different in the location can interact through two-way transmission of audio and visio. For doing this video video conference must be standarded with ITU(international Telecommunication Union) so that communication car run as what we want. Video conference has been widely used in life. For example bussiness, education, military, and other purposes in long distance. In education, video conferencing can be done for long distance education, video conferencing can be used for meetings with other universities in another town. That's why Bandar Lampung University joining in Inherent (Indonesia Higher Education Network) to attend conference video. Inherent network is a closed communication network between universities in Indonesia. To be able to conference, it is a facility obtained from inherent grant in 2007 by the directorate of higher education. This study was conducted to measure the suitability of polycom VSX 7000 video conference with standard ITU (international telecommunication union).*

Keyword- *Video Conference. International Telecommunication Union. Multipoint Control Unit*

INTRODUCTION

Video conference is a set of interactive telecommunication technology tools two or more parties in different locations can interact delivery of two-way audio and video simultaneously. Technology that used in the video conferencing system is digittal compression system audio and real streaming video.

Streaming is a technology to play video files directly or with pre-recorder from a server machine (web server). In other words, video or audio files that can be located in a server directly in a browser when the buffering process starts running. Video or audio file in the stream, will inform a buffer on the client's computer, video data, the audio will start downloading to the buffer that has formed on the client machine. In a split second, the system will read the information from

the buffer and keep doing the file download process, so the process is still on going stream to the client computer. Hardware and software that performs/do compression is called a codec. Codec rate reaches up to 1:500 generated digital 1s and 0s are divided into labeled packets, which are transmitted through a digital network. The using of audio in the shipping channel models allow the using of plan old telephone system or POTS, in some low-speed applications such as video telephone, because POTS change all digital vibration from analog waves in the audio spectrum range.

Polycom VSX 7000. Polycom VSX 7000 video conference devices is one kind of device that used at the bandar lampung university that connect to inherent (Indonesia Higher Education Network) and dikti as network centre. This device is connector between other universities in Indonesia and the IP of this device is 202.

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162. 205. 76. The design of video application network, in the video application network you should see everything carefully beacuse it will become ky factor from video application network succesful, the factors included:

1. Codec. Coding/ Decoding, which is as the brain of the system and the succesful of visual communication is really dependence on this device.
2. Bandwidth is a medium transmission capacity to transmit information to the media (video, audio, and data). If we imagine the telephone way as a water pipe, bandwidth is the size of the pipe itself, while the contents of the information that flows inside is information. The contents in the form is kbps (kilo bits persecond). For video conference is recommended 384 kbps to be produced better quality. But nowdays it has been a lot of video conference devices that can communicate only with generate less than 128 kbps of bandwidth moreover bandwidth 64 kbps.
3. Resolution, the perception of resolution which is between as the resolution relationship on its size. Usually depiction on the lable is dot or pixel. This is the standarization of video resolution.
4. Framerate. The estimation of framerate is 22 fps framerate on human's view as the soft pictute moving. The form of framerate for america and its surrounding is 30 fps with video standards NTSC and the form of picture is 704 x 480 (pixels x line). While the european and indonesian are 25 fps with PAL video standards and the form of picture is 704 x 576 image size.

Endpoint Software, in addition to the hardware endpoint, nowdays the differentiation is only in endpoint software that does not have the hardware. The work system is the same, just the need to be prepared a microphone and camera to be able to communicate. This application makes the same principle works, when using hardware endpoint all the use instructions are in the application. Actually you only need a regular camera that you can use and the most important thing is note microphone, or laptop, that can support these applications.
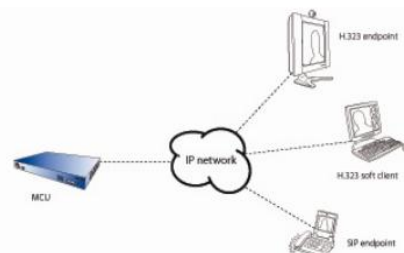
Hardware endpoint. The device used to perform video conference. In each video conference is needed endpoint required hardware in order to perform visual communication either point to point or multipoint.

MCU (multipoint Control Unit) this MCU use when will do / make video conference with more than 2 participants, requiring multipoint commnunications. This MCU can help us as administrator to manage communications involving multiple users/participants. As the user that want to see the conference can also access to the MCU and zoom-shaped stream. Pustekkom currently has 2 devices in the codian MCU 4210 with a capacity of 20 users and cidian 4215 with a capacity of 30 users.

Picture 1 . MCU Codian

When we want to make a video conference with morethan 2 participants/endpoints or multipoint MCU is needed to be able to control and manage the on going video conference. Multipoint MCU can support not only hardware but also the software can support endpoint.

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Picture 2 Schematic MCU and Relationship with Endpoint Standarization of ITU (international Telecommunication Union)

ITU is a form of international telecommunication standarization. All the video conference must follow the ITU role's standard, this is because the recommendation from all telecommunication industries. In video myst be used ITU standarization, such as:

1. H . 320 (ISDN Standard)
    This is as the window circuit standarization video conference on selected network
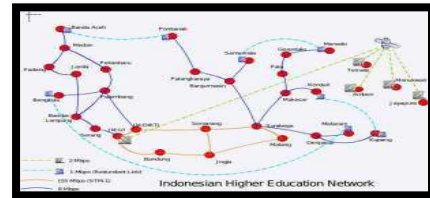2. H. 323 (IP standard)
    The standarization video conference is a window on the package selected network

Inherent (indonesia higher education network) directorate general of higher education in 2006 has built a computer network between universities, called INHERENT. The purpose and primary function of this network is to improve the quality of higher education in indonesia through utilization of information and communication technology (ICT) to support the activities of tridharma and management colleges.

The use of ICT in higheer education is also expected to motivated the human's power with good form of information resources and computing resources, and the last but not least is the human resources. Information resources such as digital libraries, database, or repository of information is expected to be used in conjuction with utilizing virtual connectedness facilitated by inherent, but of course keep giving attention to the universal rules such as copyright or other intellectual property rights. Meanwhile each unit of a computer or other electronic device that is connected to a network inherent computing resources that can be used together, for example in research is also to be used for some purposes distance learning (distance learning), especially based on ICT (e-learning) to

avail the facility of video conferencing or video streaming. That's why the college needs to develop a system and rules in order to this kind of learning that can be used integrated as an integral part of the academic curriculum and student learning.
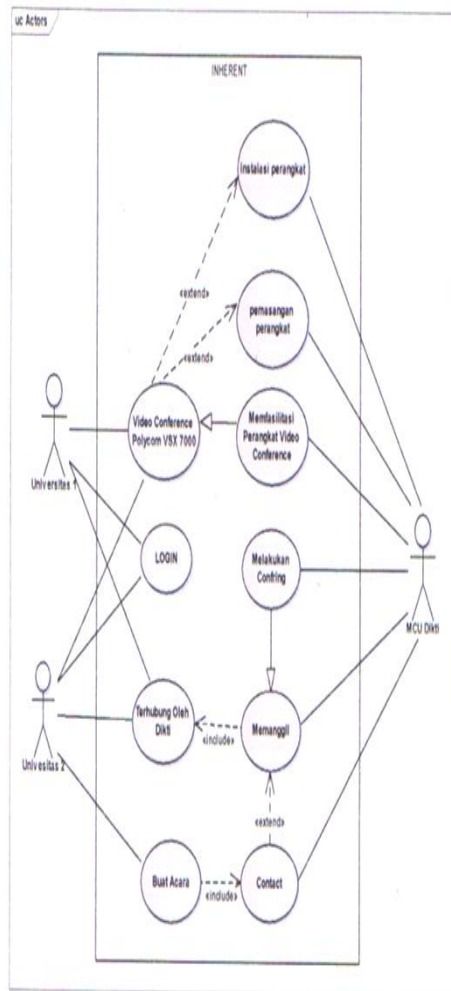

Picture 3 maps the network inherent

Procedure

Doing observation, the authors do two statements, that available to start the process of execution of video conference at bandar lampung university. First , in the beginning bandar lampung university must join in INHERENT. The next step will be expalined detail how the process of video conference MCU incorporated on higher education as a server then take conference. This is the description:

a. To be able to join inherent, can be done by connecting universities origin (city/province) to the nearest local node. The local code here is the nearest local node is the closets geographically.
b. After the local node shall consider the condition of the using wireless in each locationn so it will not disturb to other communication devices owned by entities outside inherent.
c. After phsycally connected to the inherent, it needs to make the adjusment to college interconnection between networks that will connect to the inherent network
d. Inherent will facilitate the polycom VSX 7000 video conference as well as do the installation, then the IP address allocation and making routing policy Allocation of each college will be connected to the inherent and it's really dependence with the local network conditions.
e. By joining to the inherent college, then the transaction electronic such as e-mail, web, and other applications

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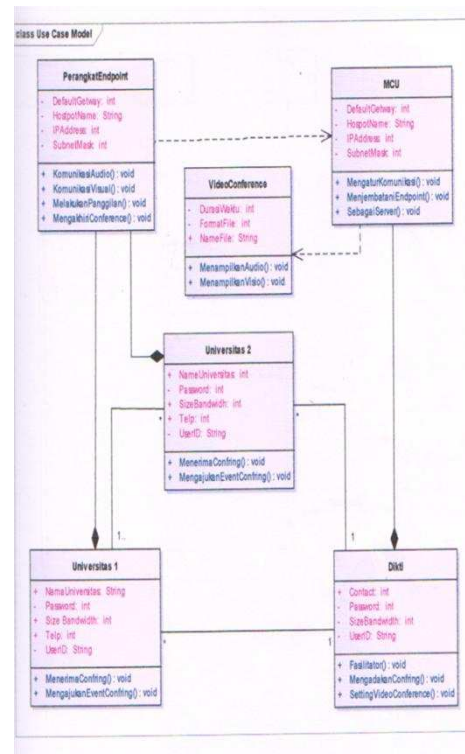*Faculty of Engineering and Faculty of Computer Science*

based on ip (ip based application) can be done through in inherent site (cannot be accessed in another site).
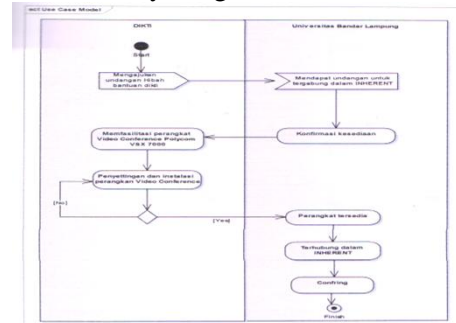
UML (unfied Modeling Language)

a. Use Case

Picture 4 usecase video conference system

b. Class diagram

Picture 5 class diagram of video conference system

c. Activity Diagram

Picture 6 activity diagram

THE RESULT

Suitability standards ITU did suitability standarization video conferencing over the internet, we need to calculate the bandwidth requirements for succesful a video conference. In general there are two bandwidth requirements that must be met, such as:

- The need of bandwidth to transmit image signal/video signal

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- The need to sent the voice signal/ audio signal

H.323	1996/1998 Non-Graduated Bandwidth Packet Switched network (Ethernet)	Format	Polycom VSX 7000
Video	H.261	CIF (352 Pixels per Line by 288 lines)	✓
		QCIF (176 Pixels per Line by 144 lines)	
	H.263	iSIF (128Pixels per Line by 96 lines)	
		4SIF (704 Pixels per Line by 576 lines)	
Audio	G.711	Frekwensi 3 KHz dan Bandwidth 56 Kbps	✓
	G.722	Frekwensi 7 KHz dan Bandwidth 56 Kbps	
	G.728	Frekwensi 3 KHz dan Bandwidth 16 Kbps	
Multiplexing Control	H.225	Frame synchronous control and indication signals for audio visual systems	✓
	H.242	Between visual telephone systems and terminal equipment on non graduated bandwidth	
Network	H.323	QOS	
		RSVP Standards	
		Packet Loss based Down Speeding	
		TCP/IP;	✓
		DHCP;	
		Auto Gatekeeper discovery	
		Dual tone Multi Frequency Signaling	
		QoS;	

The standarization of video that used in video conference polycom VSX 7000 is used in the video format is CIF (352 pixels per line by 288 lines). Standarized format for audio frequency that used is 3 Khz frequency and bandwidth of 56 kbps. Audio-visual signals. Network using TCp/IP., quitionarre After the execution of data collection from student questionarres, the data obtained then managed by using rating scale. Rating scale is a data collection tool that is used in the ovservation to describe, classify, assessment to the situation of the individual or rating scale is a data tool in the form of a list of behavioral traits/ characteristics that should be noted in stages. Rating scale is a list of attributes or attitude present as grains or item. The opinion of some, it can be concluded sense rating scale is a tool obtain data in the form of a list that contains about behavioral traits that want to investigate which should be noted stepping. The scorring will be given by the observer based on observation of spontaneous behavior others, which take place in a social hang out and communicate with that peerson for a certain peeriod time. The assessment elements contained in the statement of personal views of those who judge certain subjects on each trait or attitude on the list. Assessment was manisfested in a little determination and a gradation between a lot or maybe really available.

Because the assessment is given by a personal opinion of the observer and it is subjective. Rating scale that is completed by the observers do not mean to get an enough objective picture about people that being assessed. That's why it needs come assessment scales filled out by several people, after that it will be discussed together to get a description about someone's personality who enough reliable and accordance with the reality.

The arranging of instrument rating scale must be able to translate every no. That is given answer alternatively for every item. So the weight of score has already designed.

Weight value	Code	Description
1	SK	Sangat kurang
2	K	Kurang
3	C	Cukup
4	B	Baik
5	SB	Sangat baik

Table 2 the interval value of item rating scale

If that instrument is used as the quitionairre that will be given to 15 respondents, so before it is analyzed the data , it must be tabulation first. The no. Of score for every grain is 525 , but in this part, the highest score only 4, the no. Of grain question is 7, and the respondents are 15 persons.
The no. of two result scores, the collecting data is 349, so the quality of video conference based on 15 respondents is 349 : 252 = 66%. From that criteria that has already designed. This is continuely because it can be made

Graph , please input by yourself

as the chategory, 349 is in interval chategory "good enouh", good, and good" but it is nearest to "good enough".

Conclusion
After the author did the analysis on the system of video conference polycom

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VSX 7000 at bandar lampung university, so the author take some conclusions, such as:

1. Video conference polycom VSX 7000 has completed the standard of ITU.
2. Based on the scorring of questionarre result, for the respondent we got 9 it join on interval chategory "good enough" it means the quality of video conference still need to be improved or re-maintenance.
3. The working system of video conference at bandar lampung university when conectting with MCU inherent dikti we used streaming system.
4. The bandwidth that has already available with the needed is not match, so influenced in picture view and the frequency of voice is poorly. Because the capcity of bandwidth is lower so the speed of transferring data and the voice is also lower. Moreover the bad range of video and picture quality that are being sent.

Suggestion :

Some suggestions that can be given to deeper develop, namely :

1. Please try to prepare the bigger bandwidthn so it will give the foccus sound and the clear picture
2. Because the telecommunication is running faster, so maybe the telecommunication devices become using, so that video conference device that available at bandar lampung university should be re-newal
3. The endpoint devices is easier to become hot so it will give some obstacles in connection so it must be operated in normal temperature
4. (0-40 degree)