

## Internship on IPTV Broadcasting for Campus TV



Submitted By:

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This Report Presented in Partial Fulfilment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

Submitted To:

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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

**MAY 2019**

## **APPROVAL**

This Project/internship titled “**Internship on IPTV Broadcasting for Campus TV**”, submitted by Kazi Md Arifur Rahman, ID No: 171-15-9574 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 31 May,2021.

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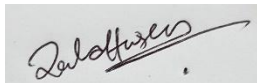


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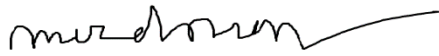
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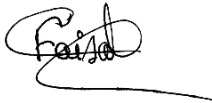
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## DECLARATION

We hereby declare that, this Internship has been done by us under the supervision of **Fahad Faisal, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

### Supervised by:



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**Fahad Faisal**  
Assistant Professor  
Department of CSE  
Daffodil International University

### Submitted by:



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## ACKNOWLEDGEMENT

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I really grateful and wish my profound my indebtedness to **Fahad Faisal, Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of my supervisor in the field of “*Internet Television Technical operation*” to carry out this internship. His endless patience ,scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this internship.

I would like to express my heartiest gratitude to Dr. Touhid Bhuiyan, Professor and Head, Department of CSE, for his kind help to finish my internship and also to other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank my entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of my parents.

## **ABSTRACT**

Internet technology has now become one of the tools in virtual communication around the world. In today's world, information is being sent from one end of the earth to the other in a matter of seconds through the use of internet technology. Where in many important places of the world such as (health, transportation, communication) has become completely dependent on internet technology, then why the entertainment or media will lag behind? This is my report on his TV series INTERNET TV. For mobile operators and infrastructure providers, large-scale, Internet-based mobile TV implementation poses both enormous opportunities and challenges. A measurement-based analysis of a large-scale mobile TV service offering in Bangladesh. Over 165.57 million unique mobile devices and 40 million people are used personal computer There were 66.44 million internet users in **Bangladesh** in January 2020. Mobile viewing habits vary from those of landline-based IPTV and VoD systems. In comparison to landline-based systems, the average viewing time is slightly shorter, and the channel popularity distribution is more skewed towards top-ranked networks.

# **TABLE OF CONTENTS**

<b>CONTENTS</b>	<b>PAGE</b>
<b>Board of Examiners</b>	<b>i</b>
Declaration	ii
Acknowledgements	iii
Abstract	v
<b>CHAPTER 1: INTRODUCTION</b>	
Introduction	1-2
About Internship	1-2
About Campus TV	2-3
Significance of the Internship	3-4
Work experience of the internship	4-6
Recommendation	6-7
<b>CHAPTER 2: MY WORKS ON CAMPUS TV SERVER SECTION</b>	
<b>APPENDIX</b>	<b>8-42</b>
Conclusion	43
<b>REFERENCE</b>	<b>44</b>
<b>PLAGIARISM REPORT</b>	<b>45</b>

## LIST OF FIGURES

FIGURES	PAGE NO
Figure 1.1: Streaming Feature	8
Figure 1.2: Server Download Process	9
Figure 1.3: Server installation process	10
Figure 1.4: streaming system working Process	11
Figure 1.5.1: VOD user Interface	12
Figure 1.5.2: Block Diagram	12
Figure 1.6: Installation Boot Process	17
Figure 1.7: Language selection process	18
Figure 1.8: Keyboard Layout	19
Figure 1.10: Installation Method Selection	20
Figure 1.11 Network configuration	20
Figure 1.12: Storage configuration	21
Figure 1.13: Software installation	22
Figure 1.14: Installation Complete process	22
Figure 1.15: Application installation in windows	26
Figure 1.16: Install Complete	27
Figure 1.17: Connecting Media	32
Figure 1.18: Blank Interface	34
Figure 1.19: Display Preview for Editing	34
Figure 1.20: Feed Switching Effect Control	35
Figure 1.21: Live Display	35
Figure 1.22: Transition Layer	36
Figure 1.23: Add content in the layer	36
Figure 1.24: Video call option	37
Figure 1.25: Real Time Set	38



Figure 1.26: Countdown Timer	39
Figure 1.27: Carousel Size processing	40
Figure 1.28 :Production Layer Unit	41
Figure: 1.29 Network Content Source	42

# CHAPTER 1

## INTRODUCTION

Mobile users can now watch live streaming TV content thanks to the exponential growth of Internet video apps and the widespread availability of smart phones. Initial deployments of mobile TV, an evolving technology over mobile networks, have been seen all over the world.

To help mobile TV implementations, all digital broadcasting technologies (e.g. DMB, CM-MB, MediaFLO) and cellular Internet data (e.g. 3G) related technologies may be used. Although one-way broadcast is the most similar to two-way broadcast, Traditional broadcast television reception, as well as broadcast-based mobile television services, generated mixed commercial results. FLO TV, a MediaFLO-based channel in the United States, was shut down in March 2011 due to a lack of viewers. The T-DMB-based service gained significant market share in South Korea, with over 25 million devices sold in the third quarter of 2009.

On the other hand, video streaming services based on mobile Internet connections have more versatility and interactivity due to the two-way Internet link. Mobile video traffic is increasingly becoming the dominant medium in mobile networks, thanks to the proliferation of mobile applications with video streaming capabilities. According to a new analysis by Cisco Systems, mobile video accounted for 49.8% of overall mobile traffic in 2010 and would surpass 50% in 2011 [1].

My findings, which are focused on a large amount of calculated data, have a number of important implications for potential mobile TV deployment. First, deploying large-scale mobile TV services over 3G and WiFi networks is both feasible and realistic. Second, because of the extremely skewed channel popularity distribution, an efficient content distribution network (CDN) for the most common channels could be designed. Third, the lognormal distribution of channel sojourn time over a limited period of time means that viewers are aware of traffic volume costs, and television programming must be tailored to

mobile networks.both in terms of the scale of the screen display and the shorter viewing times

## **ABOUT INTERNSHIP**

An internship is a training and preparation program for technical occupations. Internships are also important educational opportunities for college students and are almost a requirement for any graduate. Employers are looking for "real world" experience from college graduates, and internships are one of the best opportunities for students to get that experience.

Television is one of the most effective means of disseminating information to people in remote areas at the same time. Magazines, in addition to radio and newspapers, are forms of mass media. Television is now the most widely used medium in the world of media. Only a few moments ago, I was able to complete my internship at Campus TV, and I am very proud of that.

## **ABOUT CAMPUS TV:**

Campus TV (South Asian Television) is a privately owned high definition Internet-Based channel in Bangladesh that first broadcasted on December 20, 2016. Campus TV is a sister concern of the Daffodil Family, a well-known education network and IT logistical support provider in Bangladesh. Campus TV employs cutting-edge technology to broadcast educational content and produce programs over the Internet. The channel promotes World Education system to the mass students via workshop,seminar, Talkshow, Industry academia Lectur Series. Campus TV also hosted the world's largest Educational show on the planet, ICT Cernival, Get in teh Ring, My E-kids, which was at the time one of the most popular series on television. The channel is owned by Daffodil Family, one of the largest Education Network, ISP, Computer Business Company in Bangladesh. The company's head office are located in Dhanmondi, Dhaka.

**News room of Campus TV:** The core section of all television networks is the newsroom. Many computers with internet access are available in the Campus TV channel. Four machines are available for the newsroom editor at the national desk, four for the foreign desk, three for the business desk, two news presents desk, five producers' desks, and ten for assign national desk reporter.

Newsroom are used six computers for the central desk. There is a News Editor who works there. The Ticker headline is shown on one of the computers. Many students of daffodil international university work in different shifts together as an internship. they retain a two-hour time slot. a change Some students work in the morning, some in the evening shift.

In international desk,Campus TV gathers international news from industrialist, Professors and some international motivational speakers. They send mails, to the international students affairs office arrange the seminar, Talk-Show then International affairs arrange on it for recording or live.

The Editing Panel is another segment where footage or videos are edited and screened for playback. In the newsroom of Campus TV, there are fifteen editing tables. The panels' temperature is too low to keep their CPU running. As a result, some editing panel workers come to work dressed in winter attire. Before the news is edited, Reporter on the desk and reporter in the field given their voiceover on captured footage in the editing room.

### **SIGNIFICANCE OF THE INTERNSHIP:**

Internships are one of the best ways to gain professional experience. It opens the text book's doors to the outside world. We read a lot more in our four-year honors program, including history, Computer programming, Software analysis, Networking and many more.

But before arriving in Campus TV many more things were unknown to me. Like what is actually broadcasting system? How to complete a Television center networking. First time I didn't know how broadcasting system works. But after joining for internship the slowly became very easier for me. If a supervisor helps him/her to understand, any one can easily understand about how the media center runs. I have been in Campus TV for 3 months

internship. I have selected my work area in Networking and broadcasting section. There is a benefit to work in the Television centre. It helps to know about what is going on virtual life in the world. It also helps to know about many more networking, transmitting, frequency etc. My beat is mainly server section but here is a saying there is no finishing of learning. So I did what I could to learn the thing. And the Campus TV employees are so helpful that they called me and told me a lot of things. It is a valuable learning experience for my potential career. It also enhances the Linux server, Windows Server, Networking, Video Transferring, Video on Demand server and the modern devices. Internships are extremely important in order to meet the requirements for an honours degree and to prepare oneself for a career.

### **WORK EXPERIENCE OF THE INTERNSHIP:**

I have worked mainly at the Server section. I have learned a lot from there. Campus TV is a Educational internet based channel. IT People are work at as shifting time. My office hour is form 09:00am to 5:00 pm. It was 8 hours.

My Tasks at Campus TV:

- Connecting national and international guest using NDI protocol,
- Server configuration and log monitoring.
- FTP Server maintenance.
- VOD server configuration and adaptive video transmission.
- Chromatography.
- Streaming and Networking.
- Mikrotik Router Configuration.

My three-month internship program at Campus TV was full of new experience. I got an opportunity to broaden my horizons as much as possible. Authority give me chance to work with different types of digital equipment's. In fact, if I recall my first day on the job then, it appears to me, until the very last day. I've had many ups and downs on my journey. At Campus TV, I have worked on Real time protocol server, Vlan, Vps, Video on demand

server, Networking, FTP server, email server, web server, Application and some programming languages.

On the first day of my work at Campus TV, Head of IT **Dr. Md Nadir Bin Ali** had introduced me to the office's other employees. In fact, I was impressed with their kind demeanor. much more pleasant and unwanted Then there was my boss at Campus TV had provided a task to configure a Real Time protocol server. I had a lot of problems at the time. To begin with, I lacked sufficient knowledge of Linux servers and RAID mirroring at the time. For this reason, on the first day, I can't complete my task. I had become accustomed to the official environment after a week. Throughout these seven days, whenever I felt mentally down, my supervisor kept me motivated.

I was already aware of the value of IT infrastructure in real life during my academic years, thanks to my teachers. However, in my practice field, I can put everything I've learned throughout my academic career to use. I previously worked at Campus TV in the data center and on the user end. Now I understand the value of information technology logistics.

I am confident in my ability to configure any type of server and re-construct networking in the Data Center. I've encountered several instances where I've had to solve server problems on my own. That is, I spend the entire day analyzing the server to determine what is wrong. Indeed, it was quite difficult at the time. However, with each passing day, I've gained confidence in my work. Now I am capable of dealing with any type of work pressure and attempting to do so flawlessly.

My supervisor at Campus TV, Dr. Md Nadir Bin Ali, had experimented with my working capacity. That is why, in addition to tropology, he suggested that I add a feature based on the various types of Requirements. At first, it was challenging for me because I was unfamiliar with streaming technology. However, I was gradually improving my ability to add various types of features to the user interface. I obtained a large number of resources from GitHub's free and open-source repositories.

Every operation or piece of equipment at the television center runs like a train. I'm referring to the fact that an IT professional is constantly under pressure to ensure that operations run

smoothly. I, too, had felt the pressure. Indeed, it was impossible to operate all equipment flawlessly. Throughout my three-month internship, I was constantly confronted with this issue.

Additionally, I had encountered a variety of works. For instance, I've recorded video using a professional camera, live telephone connectivity, audio equipment, chroma background removal, and video editing. Here I've learned that I must be confident and certain about whatever information I obtain from a particular correspondent.

### **ACHIEVEMENTS FROM INTERNSHIP**

Internships are extremely important for computer science and engineering students. A student may use it to chart his or her own path to a successful career. Internships provide students with the opportunity to interact with industry professionals and meet new people.

I began my internship at Campus TV on October 11, 2019 and have gained a great deal of experience. Because of my internship, I was able to learn about various media colleagues, media houses, and media working systems. My communication skills have also developed, which will come in handy in the near future.

Working at a media house such as Campus TV has made me more dynamic than ever. As an IT trainee, I can now evaluate myself as a self-assured, self-contained, and disciplined person.

For this internship project, I had the opportunity to get a firsthand look at the IT industry. It provided me with the ability to prepare myself. It provided me with motivation to advance my career in this area.

### **RECOMMENDATION**

It's impossible for someone in an internment camp to conceal everything in a short period of time. I was especially unable to use the broadcasting system VSAT at the Frequency. Interns treated me as a junior, despite my status as a sophomore. Therefore, they're all unsympathetic to me. They gave me very little information. I was unable to locate any running gear in the time allowed. To sum up the points of learning, these are the main

points. They didn't have much time to give me any type of formal training. Because they are always busy with their work, they are seldom on time. The main problem is that I was not a member of their staff. Since my authority did not grant me access to ongoing operations, I'm unable to work on them. For testing purposes, I employed some of the backup equipment. If things went well, I will make use of this in day-to-day operations.

As a student of CSE, one should have the spirit of preparing for both the indoors and the outdoors. Therefore, I believe that internship experience ought to last at least five (5) or six (6) months. It's also important for students to participate in a variety of projects as part of class assignments. We'll benefit from this as it will increase our confidence and skill level. Interns should have a basic knowledge of computer programming, operating systems, networking, and information security.



## CHAPTER 2

### MY WORKS ON CAMPUS TV SERVER SECTION

**Operational Logistics:** Three types of logistics are needed for operational

1. Streaming engine server
2. Automation Play out Server
3. Studio Equipments

**1.1 Streaming engine server:** Wowza is the best server framework for streaming engines. The Wowza Streaming Engine is designed to provide professional-grade live streams. Stream high-definition, low-latency video and audio to any user at any scale.



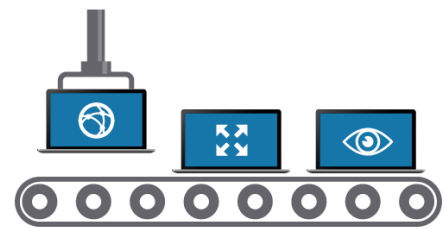
#### **Flexible and Customizable**

Gain more control over streams and tailor them to client's specific requirements. Live, linear, and on-demand content can all be streamed to any device.



#### **Built to Build On**

With a comprehensive suite of tools, services, and APIs, anyone can shorten your development cycle and build creative streaming solutions..



#### **Optimized for Scalability**

Modular architecture, automated management and tracking, strong CDN integration, and versatile deployment options all contribute to meeting the current and potential scaling requirements.

**Figure: 1.1 Streaming Feature**

## 1.2 Wowza Video Streaming Engine Download and install.

1.2.1 If your device does not currently have an installed Streaming Engine, go to the Wowza website and click Download button after that open a page and choose the proper operating system from the drop-down box.

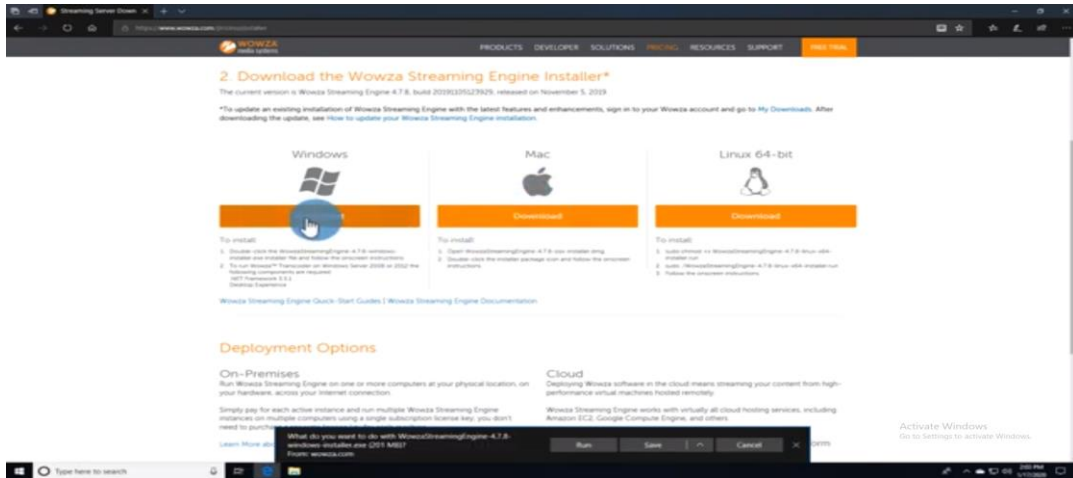
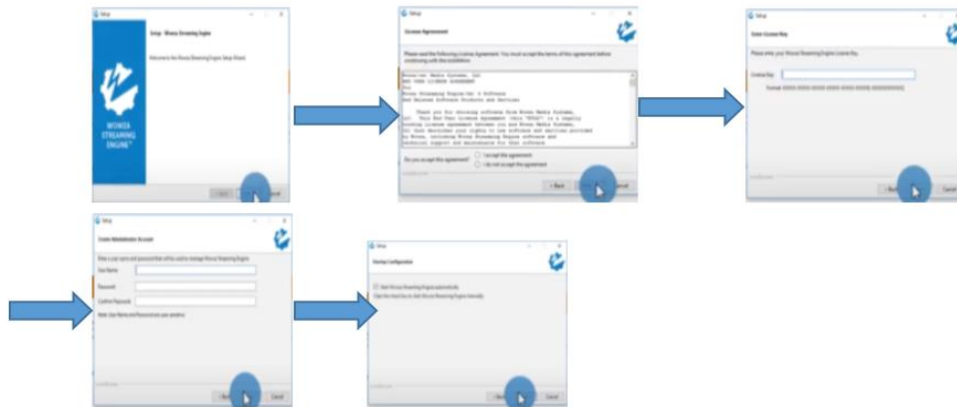


Figure: 1.2 Server Download Process

1.2.2 After downloading the installation file , follow the bellow instructions:

Windows operating system: Double-click the installation file Wowza Streaming Engine windows-installer.exe.



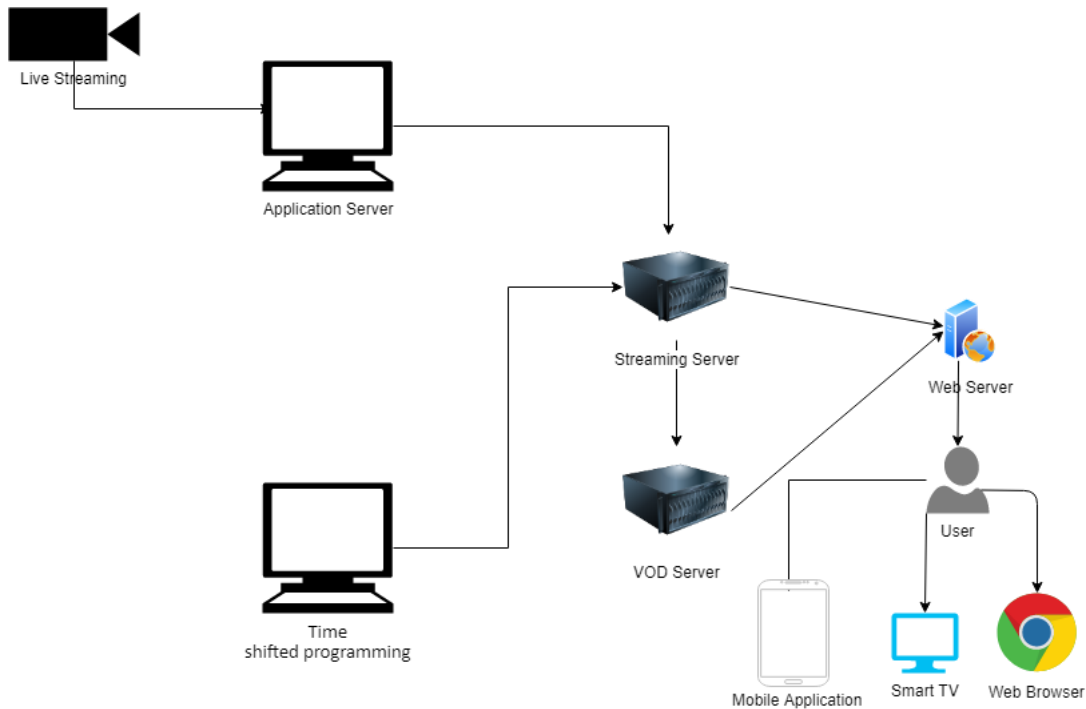
**Figure: 1.3 Server installation process**

- **Mac operating system** – Double-click the Wowza Streaming Engine osx-installer.dmg file, then the Wowza Streaming Engine-osx-installer package icon.
- **Linux operating system** – Go to the directory where you save the wowza streaming package and run installation command following the instructions:

Campus TV is a system that enables the delivery of internet television services through the internet protocol suite's architecture and networking protocols across a packet-switched network infrastructure.

Campus television services are categorized as follows: Live Streaming, Time shifted programming, and video on demand.

This report discusses the Campus TV architecture, network technologies, implementation of campus TV, Hardware and software of Campus TV are described.



**Figure: 1.4 streaming system working Process**

## Campus TV Features

**Campus TV is equipped with a variety of functions. These characteristics include the following:**

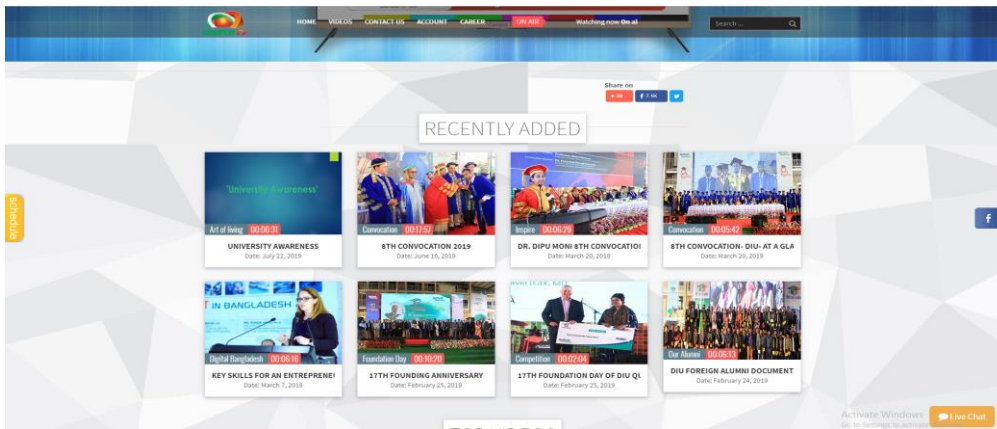
- **Support Live Streaming:** Campus TV Allow service standard live streaming, high definition TV(HDTV).
- **Time Shifting:** Campus TV in conjunction with a digital video recording enables program material to be time-shifted.
- **Accessible on multiple devices:** Campus TV material may be seen on non-smart TVs as well. Viewers often visit through their own computers and mobile devices.

## Video on Demand

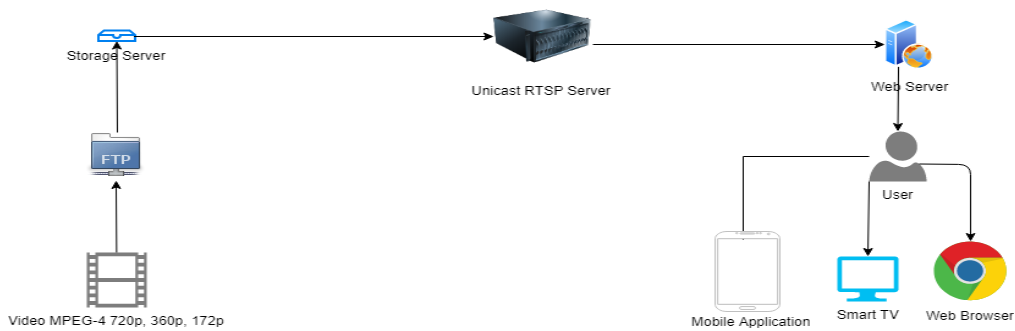
This is to enable viewers to watch whatever programming they want, whenever they want. However, as technology advances and prices fall, video on demand (VOD) becomes increasingly attractive.

Video on Demand (VOD) is based on video programs being saved and then provided to the viewer whenever necessary. This video is stored to a central server, which is capable of concurrently showing programs to hundreds of viewers while also having its content archived on many locations.

Because Unicast link is required to be established between the customers' STB and the providing streaming server, there is a requirement for such a connection. Real-time streaming protocol offers an easy-to-follow protocol for handling the Trick Play functionalities (pausing, rewinding, and restarting) (RTSP). When it comes to VOD, MPEG-2 and MPEG-4 are the most often utilized codecs.



**Figure 1.5.1: VOD user Interface**



**Figure: 1.5.2: Block Diagram**

**Server Installation:** Campus TV used the wowza streaming server. The server requirements and installation procedure are described below.

**Server Requirement:**

## Streaming Delivery: Multi-Protocol, Multi-Client

Adobe Flash® RTMP (RTMPE, RTMPT, RTMPTE, RTMPS) Adobe Flash HTTP Dynamic Streaming (HDS)	Flash Player Adobe® AIR® RTMP-compatible players HDS-compatible players
Apple® HTTP Live Streaming (HLS)	iPhone®, iPod®, iPad® (iOS 3.0 or later) QuickTime® Player (10.0 or later) Safari® (4.0 or later on Mac OS X version 10.6) Roku® streaming devices Other HLS-compatible players
MPEG-DASH	DASH-HEVC/265, DASH-AVC/264, and DASH-WebM/VP9
Microsoft® Smooth Streaming	Silverlight® 3 or later Other Smooth Streaming-compatible players
RTSP/RTP	Quicktime Player Other RTSP/RTP-compliant players VideoLAN VLC media player 3GPP-compatible mobile devices
MPEG2 Transport Protocol (MPEG-TS)	IPTV set-top boxes Multicast to any Silverlight-enabled desktop

## Live Streaming: Compatible Encoding Inputs

RTMP	Video: H.264, VP8, VP6, Sorenson Spark®, Screen Video v1 & v2 Audio: AAC, AAC-LC, HE-AAC+ v1 & v2, MP3, Speex, Opus, Vorbis
RTSP/RTP	Video: H.265 (preview), H.264, VP9, VP8 Audio: AAC, AAC-LC, HE-AAC+ v1 & v2, MP3, Speex, Opus, Vorbis
MPEG-TS	Video: H.265 (preview), H.264, VP9, VP8 Audio: AAC, AAC-LC, HE-AAC+ v1 & v2, MP3, AC-3 (Dolby® Digital), E-AC-3 (Dolby Digital Plus), ALS (LOAS), Opus, Vorbis
ICY (SHOUTcast/Icecast)	Audio: AAC, AAC-LC, HE-AAC+ v1 & v2, MP3

## Video-on-Demand Streaming: Supported File Formats

Video and audio	FLV (Flash Video— <del>flv</del> ) MP4 (QuickTime container— <del>mp4</del> , <del>f4v</del> , <del>mov</del> , <del>m4v</del> , <del>mp4a</del> , <del>.3gp</del> , & <del>.3g2</del> ) <del>.ismv</del> , <del>.isma</del> MP3 (.mp3)
-----------------	--

## Protocols and Payloads: Applicable Transport Protocol and Payload Specifications

RTSP	IETF RFC2326
RTP: H.264	IETF RFC3984, QuickTime generic RTP payload format
RTP: AAC	IETF RFC3640 IETF RFC3016 ISO/IEC 14496-3
RTP: MP3	IETF RFC2250
MPEG-TS	ISO/IEC 13818-1
MPEG-TS over RTP	IETF RFC2038
<b>System Requirements</b>	
Minimum recommended production hardware	CPU: Single quad core, 3.00 GHz or better RAM: 4GB Disk: 2 or more in RAID 0 (striping) Network: 1Gbps Ethernet
High-load recommended production hardware	CPU: Dual quad-core or a single hex-core, 3.00 GHz or better RAM: 16-32GB Disk: 2 or more in RAID 0 (striping) Network: 10Gbps Ethernet
Supported operating systems	Windows® (XP, Vista, 7, 8, 10; Server 2003, 2008, 2012, 2016) Linux (all distributions) Mac® OS X 10.8 or later



Java (required) Java Runtime Environment (JRE) or Java Development Kit (JDK) **1.8.0\_77 recommended**; JRE/JDK 1.7 is also supported.

#### Transcoder

Decoding (inputs) Video: H.265/HEVC (preview), H.264/AVC, MPEG4 Part 2, MPEG2, VP9, VP8  
Audio: MP3, AAC-LC, HE-AAC+ v1 & v2, MPEG1 Part 1/2, Speex, Opus, G.711, Vorbis

Encoding (outputs) Video: H.265/HEVC (preview), H.264/AVC, H.263 (v2), VP9  
Audio: AAC, AAC-LC, HE-AAC+ v1 & v2, Opus, Vorbis

#### nDVR

Live stream caching and playback Single content cache for simultaneous playout to Flash HDS, Microsoft Smooth Streaming, and Apple HLS clients

Live stream time-shifting Pause, rewind, fast-forward, return to live

#### DRM

Third-party key-management services BuyDRM™, Verimatrix®, and EZDRM

Encryption services ++ Inc. Common Encryption for MPEG-DASH BuyDRM: Microsoft PlayReady® ++  
Verimatrix: Verimatrix® VCAS™ ++, Microsoft® PlayReady®  
EZDRM: Microsoft PlayReady®

Live and on-demand clients PC, Mac, iOS, Android, Windows Phone Game consoles, set-top boxes, smart TVs BuyDRM: BuyDRM players and Smooth Streaming clients  
Verimatrix: ViewRight® web clients and Smooth Streaming clients  
EZDRM Live: Smooth Streaming clients  
EZDRM VOD: Discretix SecurePlayer™ and Smooth Streaming clients (note: EZDRM does not support iOS or Android)

**Operating System Installation:** We used Ubuntu server for using Wowza streaming engine.

## Ubuntu Installation:

### 1. Boot from the installation media.

Perform the following steps to start the installation process:

- a) Go ahead and use your computer's DVD drive to upload the Ubuntu DVD (or insert the USB stick or other install media).
- b) Your machine should be restarted.

After a few seconds, you should see notifications on your phone similar to the ones below...

```
chroot: can't execute 'glib-compile-schemas': No such file or directory
Using CD-ROM mount point /cdrom/
Identifying... [92043204992947830abda80987b766a7-2]
Scanning disc for index files...
Found 2 package indexes, 0 source indexes, 0 translation indexes and 1 signatures
Found label 'Ubuntu-Server 16.04 LTS _Bionic Beaver_ - Beta amd64 (20180404)'
This disc is called:
'Ubuntu-Server 16.04 LTS _Bionic Beaver_ - Beta amd64 (20180404)'
Copying package lists... [ TIME ] Timed out waiting for device dev-disk-by\x2duuid=00c629d6\x2d06ab\x2d4dfd\x2db21e\x2dc3186f3410
5d.device.
[DEPEND] Dependency failed for /subiquity_config.
[ OK ] Started Uncomplicated firewall.
[ OK ] Started Create list of required static device nodes for the current kernel.
Starting Create Static Device Nodes in /dev...
[ OK ] Mounted POSIX Message Queue File System.
[ OK ] Mounted Kernel Debug File System.
[ OK ] Started Remount Root and Kernel File Systems.
Starting Load/Save Random Seed...
[ OK ] Mounted Huge Pages File System.
[ OK ] Started Load/Save Random Seed.
[ OK ] Started Create Static Device Nodes in /dev.
Starting udev Kernel Device Manager...
[ OK ] Started Journal Service.
Starting Flush Journal to Persistent Storage...
[ OK ] Started udev Kernel Device Manager.
[ OK ] Started Load Kernel Modules.
Mounting Kernel Configuration File System...
Mounting FUSE Control File System...
Starting Apply Kernel Variables...
[ OK ] Started Flush Journal to Persistent Storage.
[ OK ] Mounted FUSE Control File System.
[ OK ] Mounted Kernel Configuration File System.
[ OK ] Started LVM2 metadata daemon.
[ OK ] Started udev Coldplug all Devices.
[ OK ] Started Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling.
[ OK ] Started Apply Kernel Variables.
```

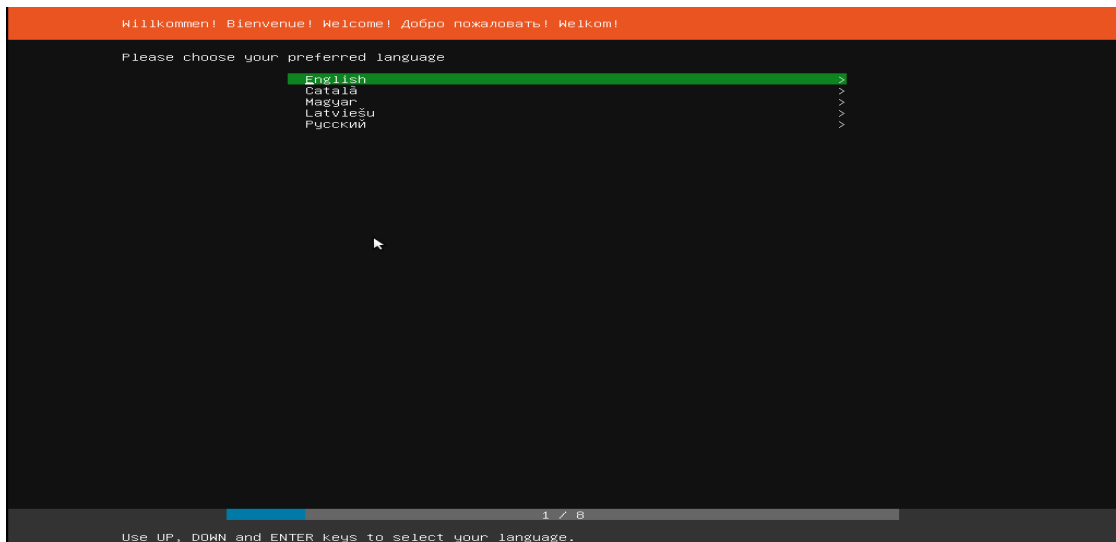
**Figure: 1.6: Installation Boot Process**

While most computers are capable of booting automatically from a USB or DVD drive, this feature can be disabled in some cases help speed up boot times. If you do not see the startup will display the message and the subsequent "Welcome" screen, you must configure your machine to boot from the install media.

When the machine boots, an on-screen message should prompt you to select a key to access settings or a boot menu. Depending on the manufacturer, this may be Escape, F2, F10, or F12. Simply restart your device while holding down this key, select the Ubuntu installation media drive from the boot menu that appears.

## 2. Select your preferred language.

Following the boot notifications, a 'Language' menu will appear.

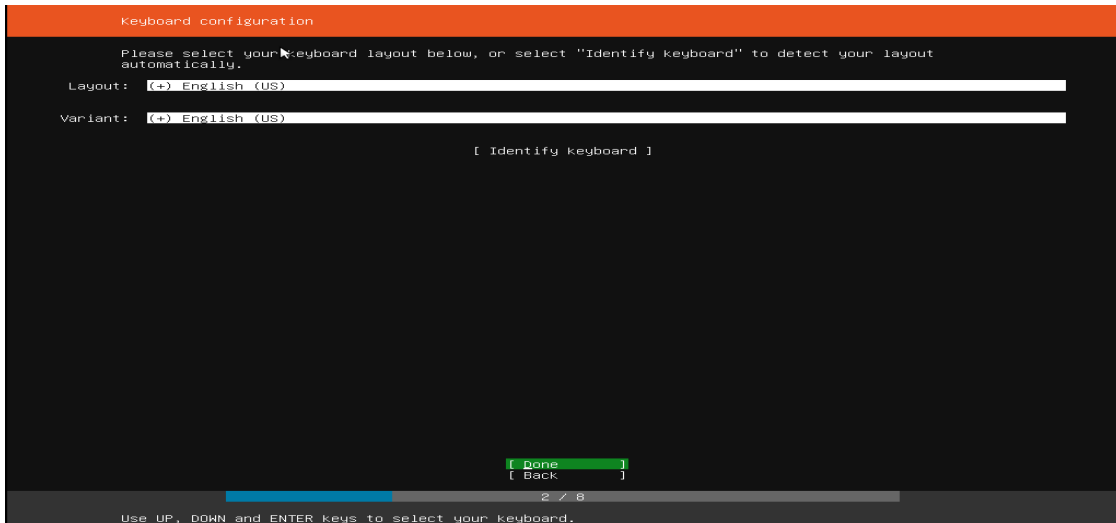


**Figure: 1.7: Language selection process**

To do this, click the Up, down, and Enter keys in the menu to go through the menu and choose the language you wish to use, as the message instructs.

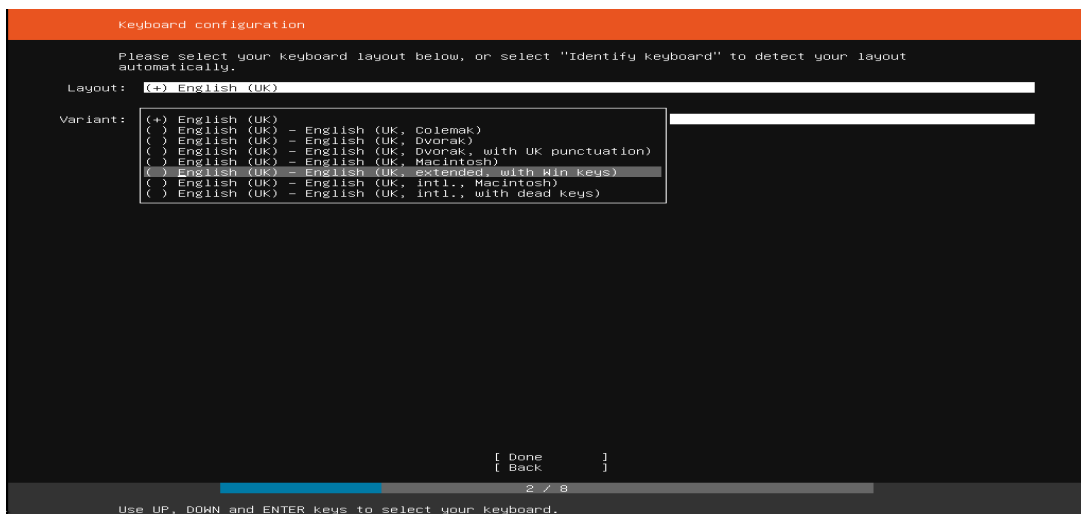
## 3. Select the appropriate keyboard configuration.

The application will then show a message telling you to choose layout for keyboard and, if necessary, the version before you need to type something in.



**Figure: 1.8 Keyboard Layout**

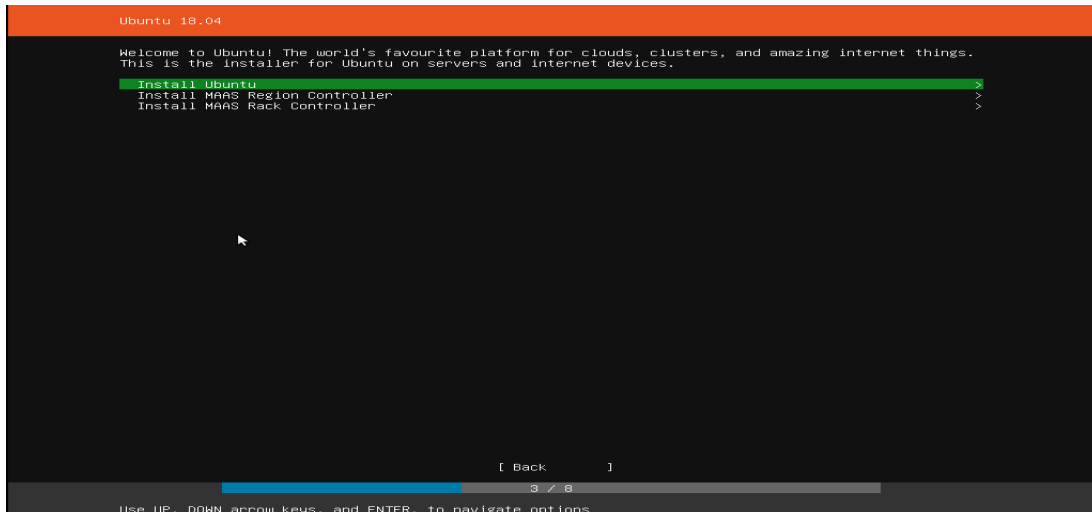
If you're not sure the version you like, using the default installation process; After the Ubuntu Server OS is installed, you'll be able to test and adjust your preferences more easily.



**Figure: 1.9**

#### 4. Select your installation method.

Now it's time to choose what you want to install. On the menu, there are three choices:

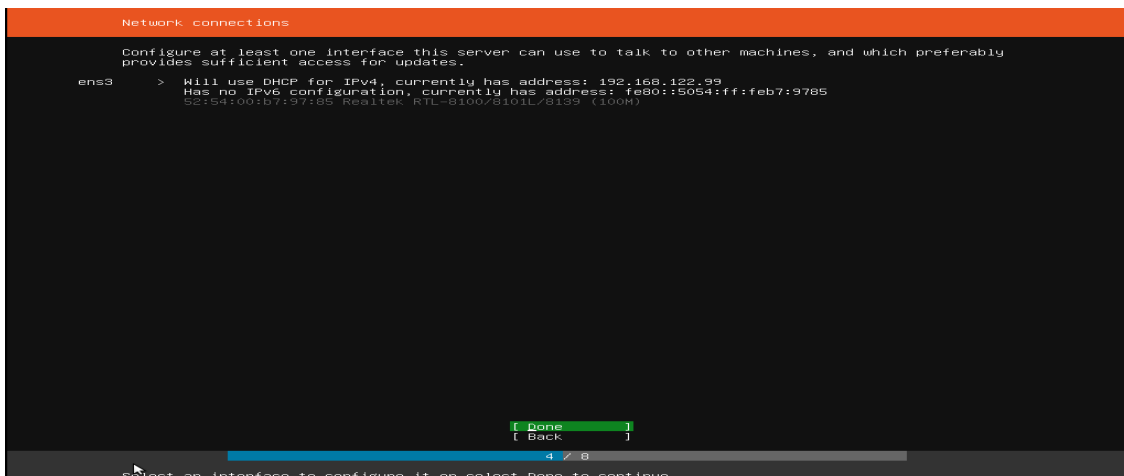


**Figure: 1.10: Installation Method Selection**

The bottom two choices are used to mount individual components of an MAAS installation. If you're downloading MAAS, you can consult the MAAS documentation for clear information! This guide assumes you choose the first choice, Ubuntu Installation.

## 5. Networking

Any network connections will be automatically detected and attempted to be configured via DHCP by the installer.

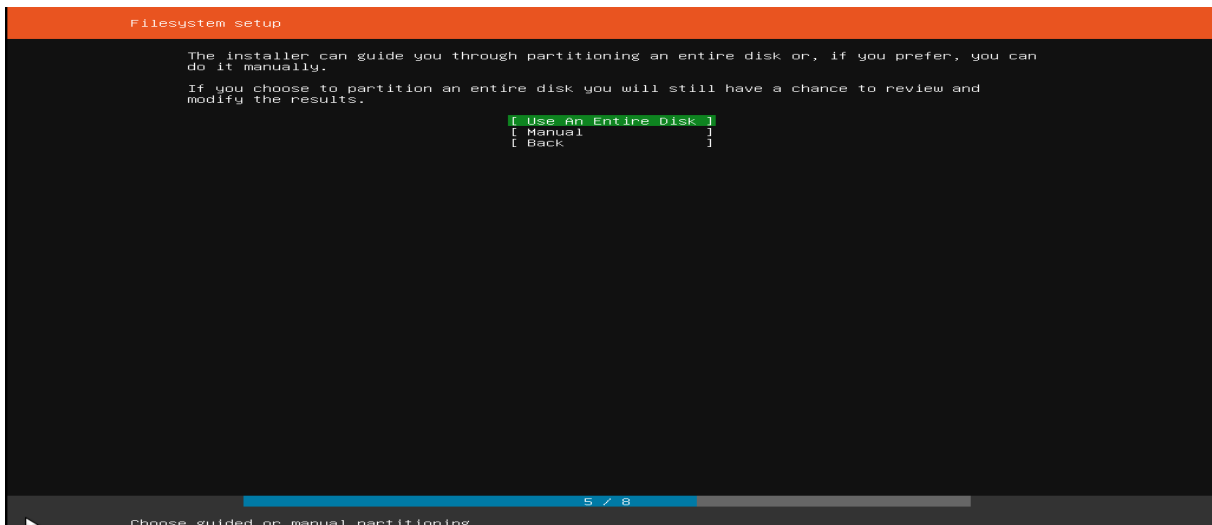


**Figure: 1.11: Network configuration**

This screen is normally automatic, and you won't have to enter anything; it's only for details.

### **Set up your storage.**

The following move is to set up storage. It is recommended that you dedicate an entire disk or partition to running Ubuntu.

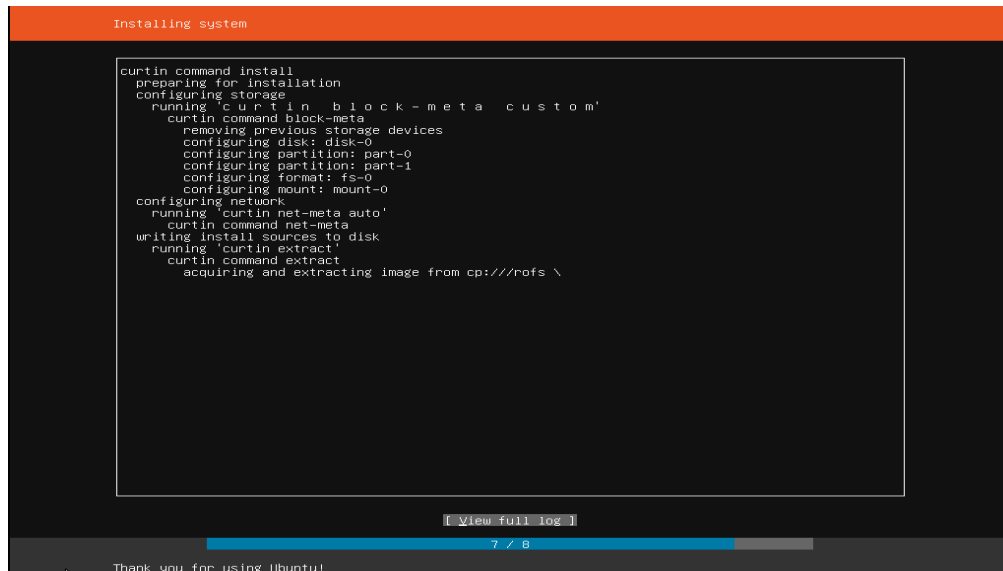


**Figure: 1.12: Storage configuration**

The manual choice allows you to pick and reorganize partitions on any attached drives if you want to install more complicated system.

## **6. Software should be installed.**

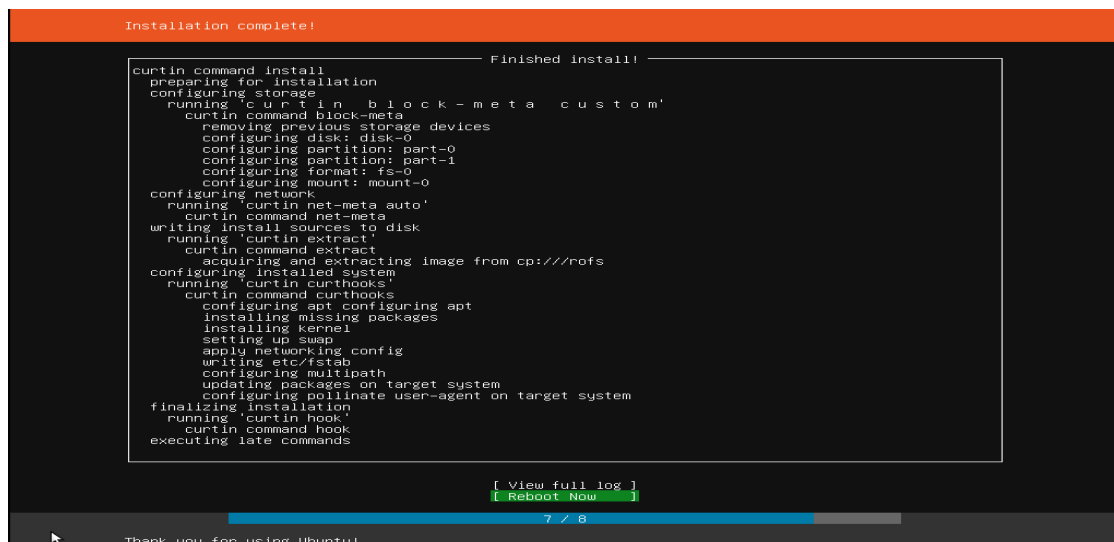
After you've entered all of the necessary details, the screen will display the installer's progress. Ubuntu Server now installs a condensed collection of server-related applications. This significantly reduces the time required for installation and configuration. Of course, you can integrate any kind of extra software if you need after completing the installation.



**Figure: 1.13: Software installation**

## 7. Completed installation

When the installation is finished, you'll see a message similar to this on your phone.



**Figure 1.14: Installation Complete process**

Remember to uninstall the installation media before rebooting and starting the server. Hello and welcome to Ubuntu!

**Start the wowza streaming engine installation procedure after you've finished installing the server operating system.**

➤ **Wowza Streaming Engine is available for download and installation.**

```
sudo chmod +x WowzaStreamingEngine-4.7.7-linux-x64-installer.run  
sudo ./WowzaStreamingEngine-4.7.7-linux-x64-installer.run
```

1. Accept the terms of the license agreement through the installation wizard.
2. Enter a wowza streaming engine license key that is legitimate.

If you purchased a new license key, it will be included in the email from Wowza Sales. Find license key in the directory of [install-dir]/conf/Server.license file if you have a previous version of Wowza Streaming Engine enabled.

3. For an Admin account, need to create a user name and password for first time access. The case of the user name and password is significant.

➤ **Make sure Wowza Streaming Engine is up and running.**

Open a web browser and type the following URL to see if Wowza Streaming Engine is up and running:

[http://\[wowza-server-ip-address\]:1935](http://[wowza-server-ip-address]:1935) ,

where [wowza-ip-address] is the Wowza Streaming Engine server's IP address or domain. Consider the following scenario: <http://campustv.ac:1935>

The browser shows the Wowza Streaming Engine version number if Wowza Streaming Engine was configured correctly. If it doesn't, make sure the server software is up to date and that TCP port 1935 is available on your router, firewall, and iptables.

➤ **Go to Wowza Streaming Engine Manager and log in.**



Now you have confirmed Streaming Engine is properly installed, log in to the Engine Manager.

Wowza Streaming Engine Manager can be used with many other browser plugins that facilitate HTML5 and Cascading Style Sheets level 3. (CSS 3). For the best performance, we suggest that you're using the most latest version of Google Chrome.

By default, Wowza Streaming Engine wants to accept connections from Wowza Streaming Engine Manager on localhost. For information on connecting to Wowza Streaming Engine on a non-localhost device, see [Connect to remote Wowza Streaming Engine instances](#).

Open your web browser and type your server address like as:

[http://\[wowza-server-IP-Address\]:8088/enginemanager](http://[wowza-server-IP-Address]:8088/enginemanager)

where [wowza-server-ip-address] is will be your server's local or public IP address or configuration host address that you want to test. Consider the following scenario:

<http://campustv.ac:8088/enginemanager>

You specified a login Name and secrete when you installed Wowza Streaming Engine.

Click Sign In.

Now that the server is set up, it's time to set up the real-time streaming workstation.

### System Requirement:

CPU	2.8GHz Intel Xeon E3-1505M v5
Operating System	Windows 10
RAM	32GB
Hard Drive Size	512GB SSD
Graphics Card	NVIDIA Quadro M1000M Graphics
Video Memory	4GB
Wi-Fi	802.11ac

```
sudo chmod +x WowzaStreamingEngine-4.8.5-linux-x64-installer.run
```

```
sudo ./WowzaStreamingEngine-4.8.5-linux-x64-installer.run
```

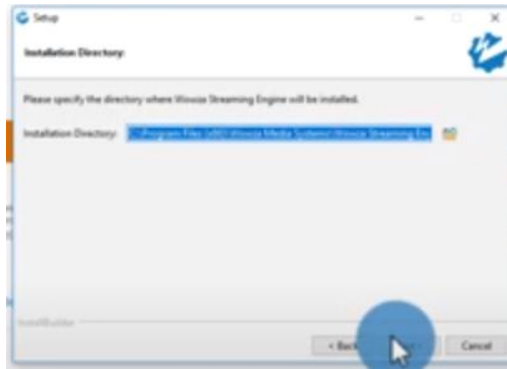
- 1.2.3 Accept the terms of the license agreement in the installation wizard.
- 1.2.4 Enter your license key which is provided your purchases time.

The license key should be included with the email from Wowza Sales if you just purchased a new license key. The previous version of Wowza Streaming Engine is enabled if you find the license key in the [install-dir]/conf/Server.license file..

- 1.2.5 For an Admin access, need to create a user name and password. This set of credentials will be used to gain access to the browser-based Wowza Streaming Engine Manager. It is very important that the password and username case be taken into consideration. Adjust or confirm the installation position.

Wowza Streaming Engine places files in the following locations by default:

- Windows – /Program Files (x86)/Wowza Media Systems/Wowza Streaming Engine 4.8.5/



**Figure: 1.15 Application installation in windows**

• macOS –

/Applications/Wowza Streaming Engine 4.8.5/

/Library/LaunchDaemons/

/Library/WowzaStreamingEngine/ (an alias)

/Library/WowzaStreamingEngine-4.8.5/

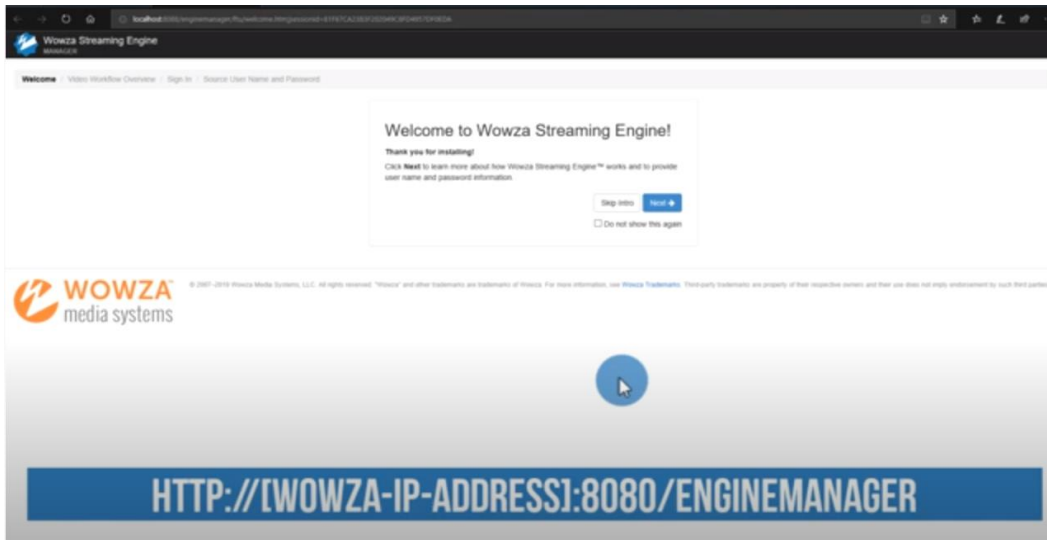
- Linux – /usr/local/WowzaStreamingEngine-4.8.5/ (as the root user)

1.2.6 Make any necessary adjustments or confirmations to the Startup Configuration option you want to use.

Wowza Streaming Engine can be run as a device service or in autonomous mode from a command shell. By default, the Start Wowza Streaming Engine actually scan box is selected, which tells the server program and Wowza Streaming Engine Manager to start as system services.

- System services running as a system service are commonly found in server implementations where the server will automatically restart when the device is rebooted.
- Running the server in standalone mode allows it to be started and stopped easily, which is ideal for building custom applications. For information on starting and stopping Wowza Streaming Engine in standalone mode, see Start and stop Wowza Streaming Engine.

1.2.7 Click **Finish**.



**Figure: 1.16 Install Complete**

**Mode of operation:** Basically Campus TV conducts activities in following three mode.

1. Recorded Mode
2. Live Mode

**Recorded Mode:** All recorded program broadcast 24/7 as a weekly SIX hour schedule based from PCR location.

**Live Mode:** Currently four facilities are available in the live production.

- 1.1 Live from remote location
- 1.2 Live from studio
- 1.3 Recorded Live
- 1.4 Live from post production room

**Live from remote location:** Campus tv streamed any live event through over internet from any location using some hardware and software logistics.

- a) Streaming software ( Wirecast and OBS )
- b) Streaming Engine ( Wowza )
- c) Capture card ( Audio and Video )
- d) Video switching panel ( For Multi-cam system)

**Streaming Software:** Randomly we using basically two software for live event streaming

1. Wirecast Payout
2. OBS ( Open broadcasting system)

**Wirecast:** wirecast is a popular shot switching streaming software. It's a user friendly application. Many types of features are available for the live streaming in this software. 29 of streaming destinations source are supported on this software.

**Available features:**

- A. **Capture:** Unlimited Source (Camera, microphone, webcams, IP Cams). Here we can select separate audio source for separate shot)
- B. **NDI/Desktop/Web capture:** Capture everything on your computer screen or on other computers. Auto-detect NDI and Syphon sources. Web browsers allow you to view live web pages.
- C. **Professional Audio:** Multi-channel audio in, ASIO supported, Core and WASAPI Audio supported devices. Mixing eight different types of audio tracks, and supported FX filtering mood and processing.
- D. **Remote Conferencing:** Rendezvous person-to-person video call conferencing system built-in to Wirecast. Send a link to the guests for join your live broadcast.
- E. **Shoot Replay, Score boards, Timers:** Wirecast is a best application for streaming a sports. there have many professional features.
- F. **Title ticker:** Wirecast has some built-in lower third virtual studio and title ticker.

**Limitation of current version of Wirecast:** All available features is amazing for IP TV streaming. But have some of limitation for the user like as this software can't connect **SSL** secured streaming server. Example <rtmp://203.190.11.101/live> <rtmps://203.190.11.101/live> For the limitations of wirecast we can't direct broadcast to facebook or any types of SSL secured destination.

That's why we use another software OBS for broadcasting to SSL secured destination.

Here you get booth of software user manual.

1. wirecast manual
2. OBS Manual

**Capture card (Audio and Video):** We capture any camera feed to PC using a capture card. There are many types of capture card are available in market. We choose

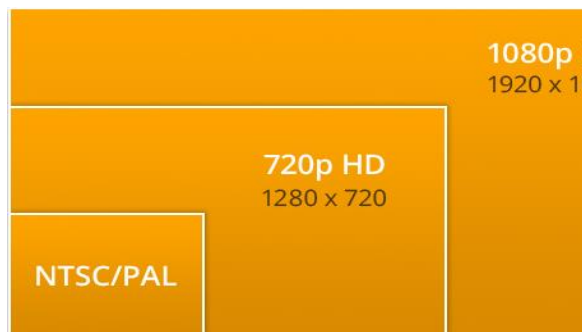
- a) Black Magic
- b) Usb3.0 Capture card

**Black Magic:** Shuttle pro capture card allows you to capture and playback within the most incredible quality video using HDMI and component analog video in both SD and HD.

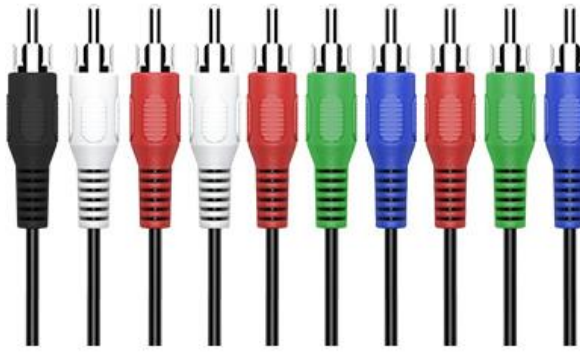


**Thunderbolt™ usb cable**

It's simple to add Intensity's incredible consistency to your workstation! Intensity comes in a variety of models that link to PC via USB 3.0 and Thunderbolt™ technology for the highest data transfer speeds possible. With portable devices that are operated by a computer link, you can now catch the highest uncompressed 1080HD video! That's a true portable device!



Working with compressed and uncompressed video in standard definition PAL/NTSC up to maximum 1080HD video is possible with Intensity Shuttle.



### **Highest Quality Analog Connections**

The RCA connectors on the Intensity models enable you to use any analog video or audio equipment. Compatibility with analog part, composite, and S-Video in NTSC or PAL, as well as analog audio




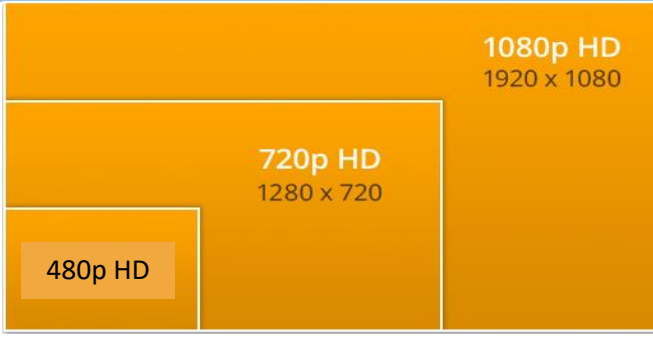
### **True HDMI Digital Connections**

Intensity comes equipped with the highest-quality HDMI connections, which are the industry norm for consumer digital video equipment. HDMI links TVs and other devices to provide full HD video and digital audio.

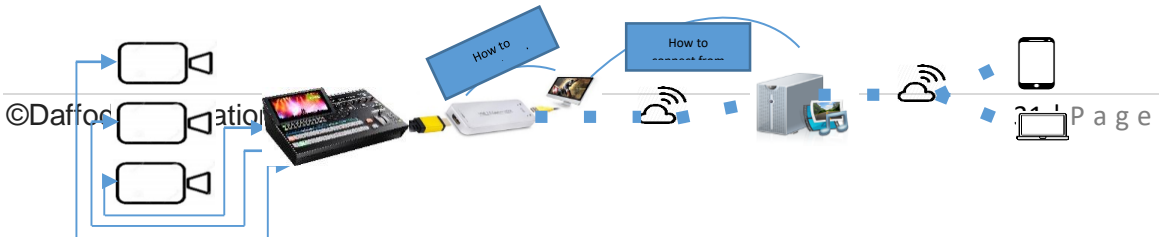
**Limitation of Intensity Shuttle Pro:** This card has a lot of great features. However, this card contains some difficulties. As an example, this card necessitates the use of a firmware program and the constant opening of integration applications, which slows down the workstation. When using streaming software to bind to this computer, the integration software sometimes fails.

Another disadvantage of this unit is that it cannot be used for an extended period of time. It's a device that generates heat. This system shuts down automatically if it gets too hot.

**Usb3.0 Capture card:** Usb3.0 Capture lets you capture in the most incredible quality HDMI HD.

	<p><b>USB 3.0</b></p> <p>It's easy to add the capture card to your laptop, desktop or computer workstation! USB 3.0 capture card is available in different models that connect to computers using USB 3.0 technology with the fastest data transfer speeds. With portable devices that are operated by a computer link, you can now catch the highest uncompressed 1080HD video.</p>
	<p>Working with compressed and uncompressed video in standard definition HD up to maximum 1080HD video is possible with a USB 3.0 capture card.</p>

**Limitation of USB 3.0:** This card has a lot of great features. However, in wirecast and Vmix streaming software, this unit can accommodate HDMI cables up to 5 meter. If you try to use an HDMI cable with a 15-degree bend, it will only work with the OBS streaming app. This unit, on the other hand, can be used for casting all day.





### **Figure 1.17: Connecting Media**

**Live from studio:** Campus TV streamed any live event (Talk show, News) through over internet from studio using some hardware and software logistics.

#### **My works on Campus TV Operation and Streaming Encoding Section:**

##### **Application Requirement:**

1. Microsoft .net 3.5 or higher
2. Wirecast , Vmix, OBS etc.
3. Necessary Hardware Driver.

Telestream Wirecast was used in our setup. It is the most popular and user-friendly streaming app. We used this program in our broadcasting system because of this.

Wirecast makes it simple to broadcast and create professional footage. With Wirecast, you can transform your laptop or tablet into a television studio.

**Wirecast Workflow:** Wirecast is an application for switching live video. Encoding video for multiple platforms supported. It usually sits in the center of a broadcasting workflow due to its flexibility in managing a range of inputs and outputs.

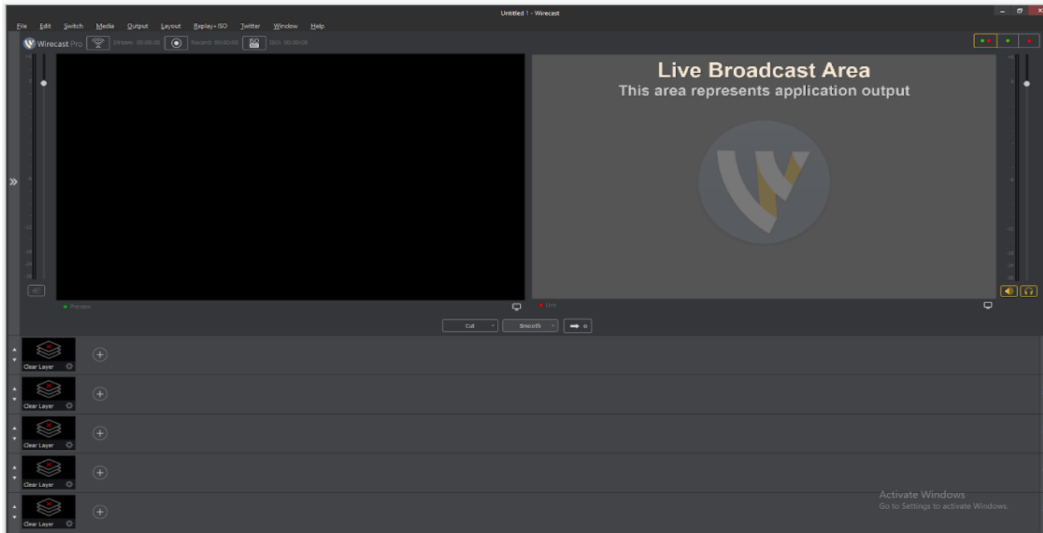
The basic function of Wirecast is in general, you will add live input devices and capture video (such as camera feeds, iOS/Android cameras, Present computer desktops, website feeds, and more), make show for streaming using different types of tools like as (Chroma

key, titles, graphics, Sports scoring, and more), after that you can stream to the web, LAN, or record it locally.



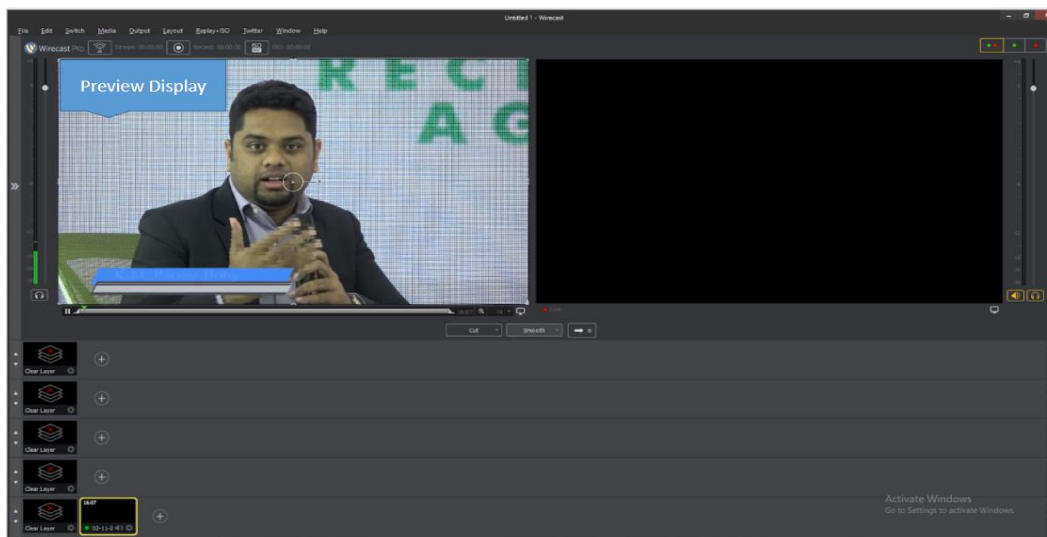
Cameras, capture cards, and audio devices are all supported by Wirecast. It prepares media before streaming it to the Internet, CDNs, multicast/unicasts via LAN, virtual performance, or a second display locally.

This post is designed to walk you through the process of creating and broadcasting a presentation in as little time as possible. The lecture is only accessible to someone who has bought Wirecast. The quickest way to get help is to open the Solutions were prepared in Wirecast and choose "Tutorial".



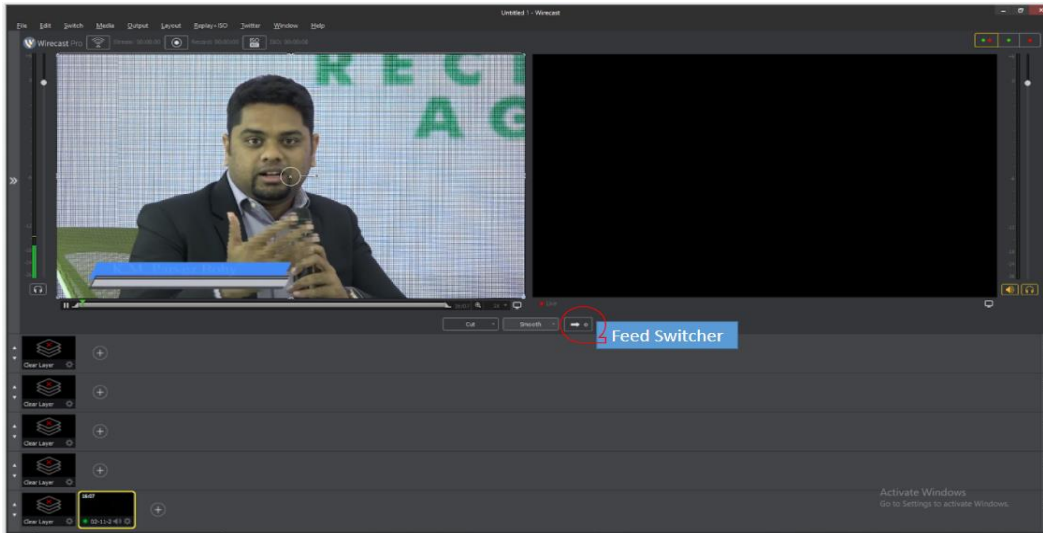
**Figure: 1.18 Blank Interface**

In Wirecast, you have two major display areas: the Streaming Transmission region and also the Shot List. The Streaming Transmission section is located at the top of the Wirecast window, where you will get the content that you transmit to your audience. The Shot List, located in the bottom part of the player window, lists the shots that are available to stream.



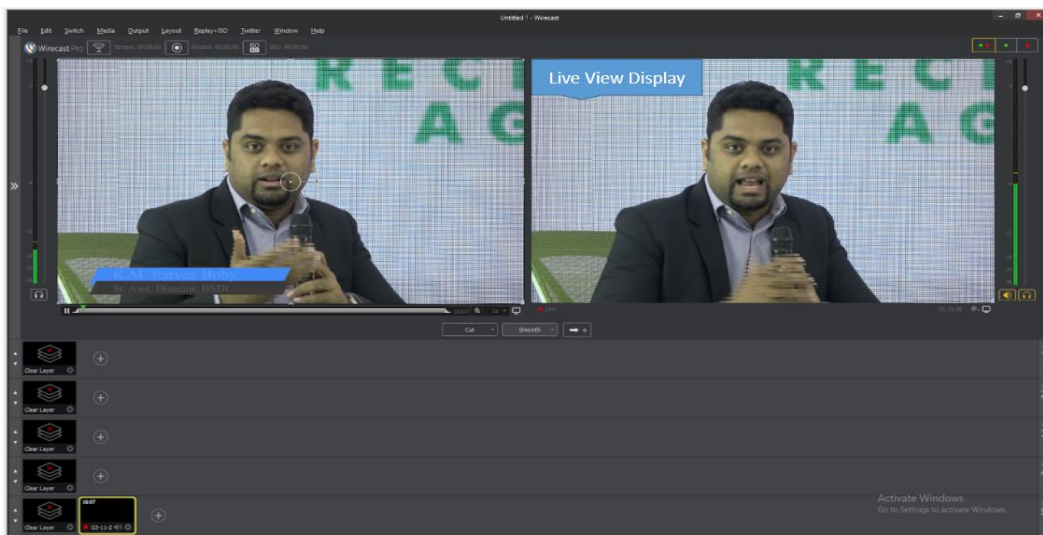
**Figure: 1.19 Display Preview for Editing**

You will need to do a number of adjustments before the lesson can begin. Ensure the Smooth and Auto-Live modes are enabled (check mark shown) in the Switch submenu, and disable the Live/Preview Switch setting in the Live/Preview Swap submenu.



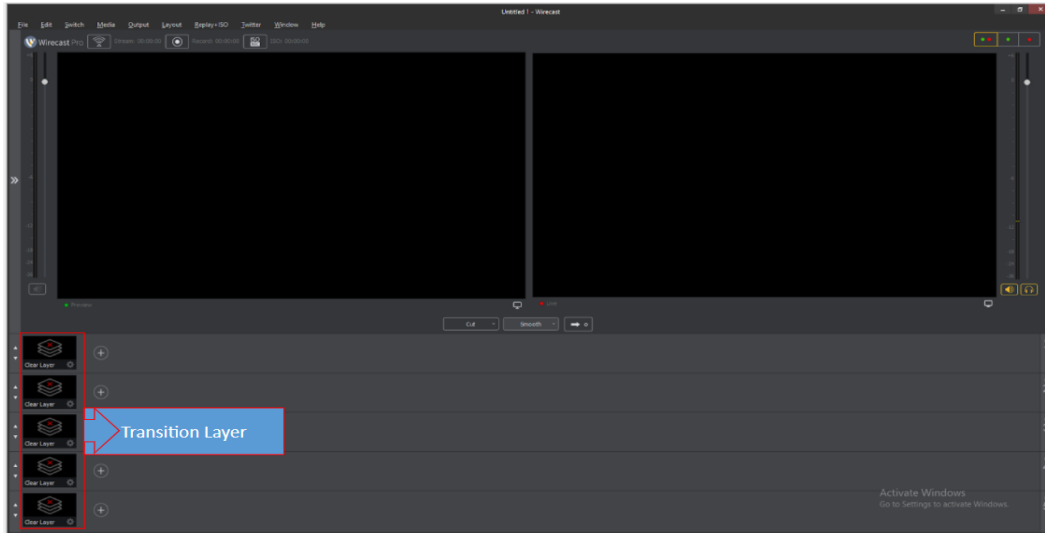
**Figure: 1.20 Feed Switching Effect Control**

Each each shot is shown below Shot List. Fading the picture into the live broadcast area happens when you choose the Ripples shot inside the Shot List and after the transition finishes, the picture displays in the Live Broadcast Area. You may refer to it as “taking a shot on stage”



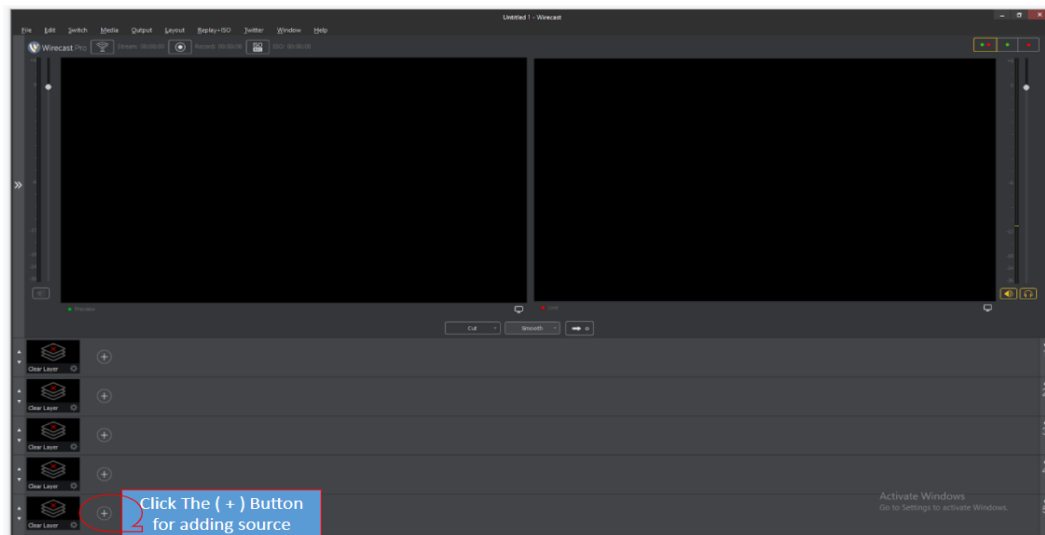
**Figure: 1.21 Live Display**

The Layered concept of Wirecast allows you to place multiple shots into in the Preview and Real - time window frames at the same time, displaying them in a stacked order in the order defined by Wirecast's Layered. This is a great method to both add and delete things in your live video feed.



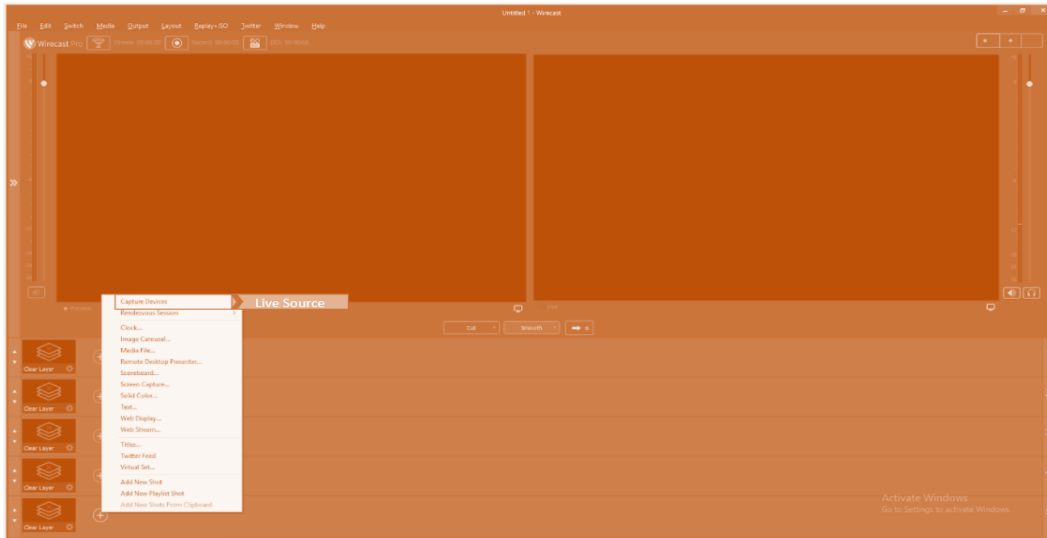
**Figure: 1.22 Transition Layer**

Click the Plus (+) Button to add content source. After you've added the content, content will be shown to the preview display. You can adjust the shot as you want to stream to the viewers.

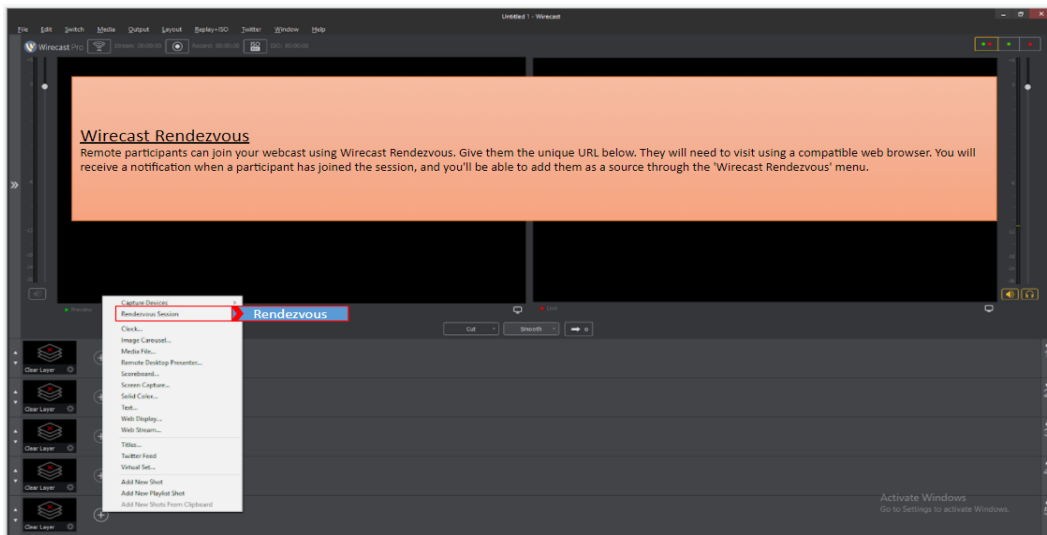


**Figure: 1.23 Add content in the layer**

The various types of live video sources are shown here. You need to identify what you need. After selecting the source, then you can select content or devices for displaying the content.

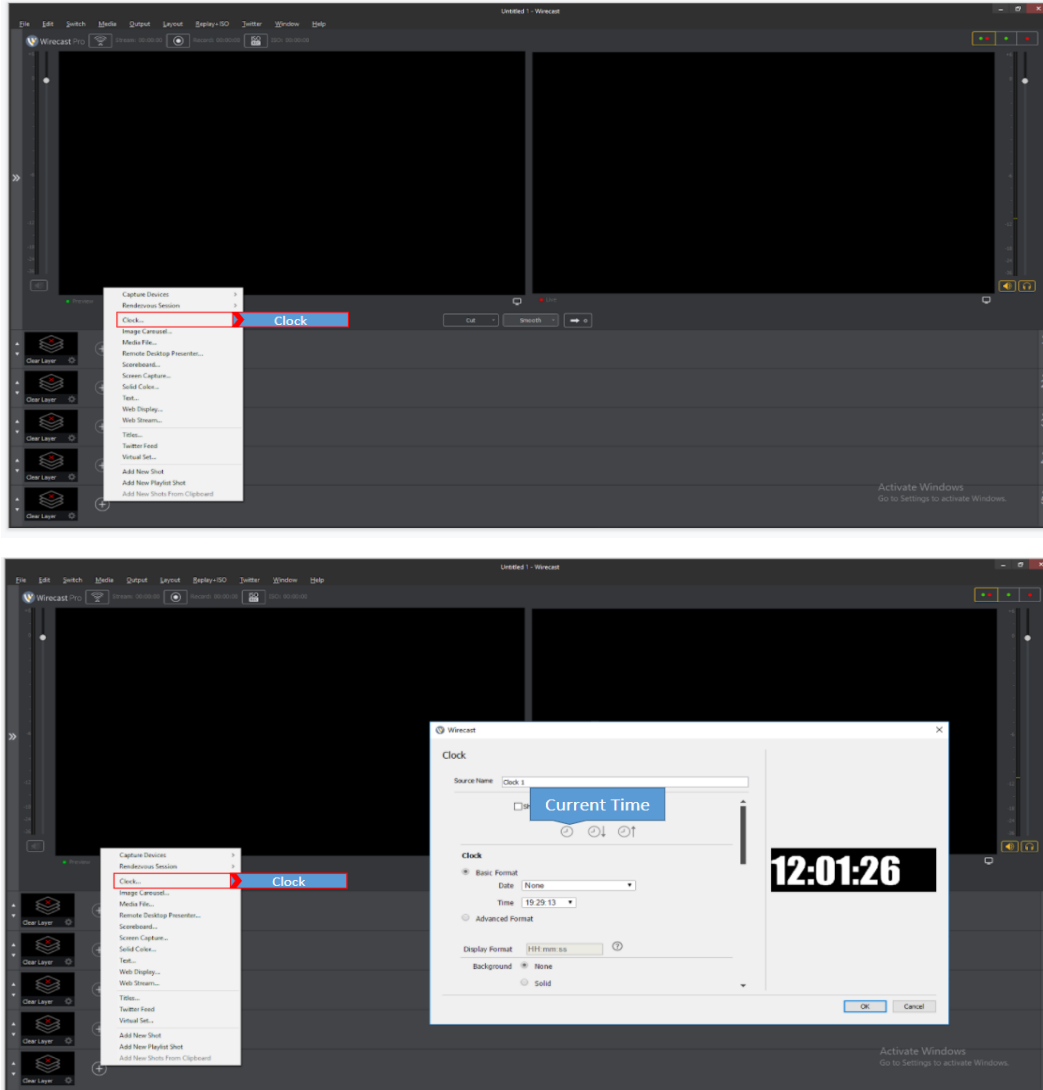


Rendezvous is an option where you can add a live video call. Like as if you want to add a guest from outside of the studio in your live session. You need to create a rendezvous session from wirecast. You got a link and the link needed to send your guest to join the live session.



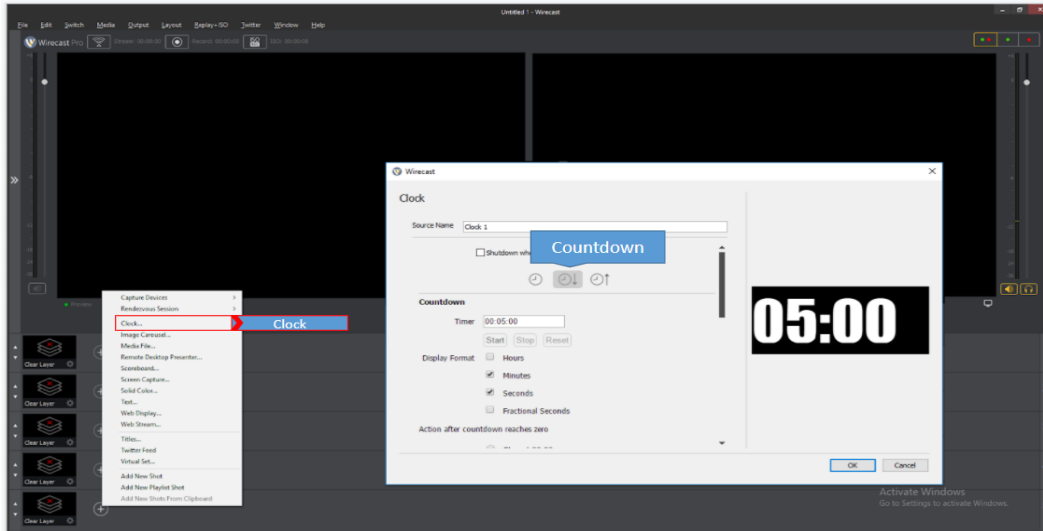
**Figure: 1.24 Video call option**

Using a real-time clock display feature, you may show your readers the correct time of day in different regions of the world. We are able to view each TV broadcast show local time in real time.

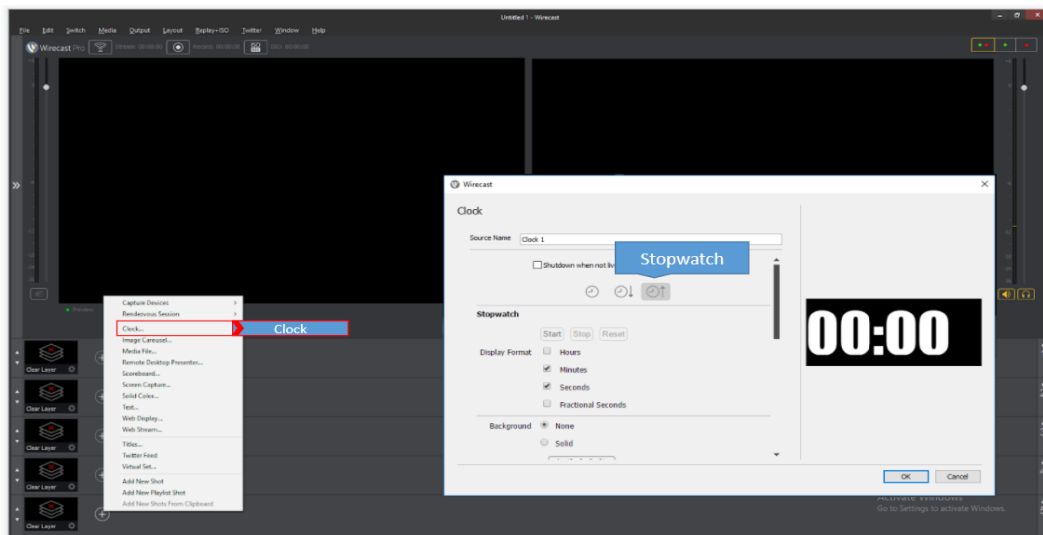


**Figure: 1.25 Real Time Set**

On the other hand, here you have a second countdown choice for you. There are two different methods to use to show any custom countdown. You may use one of these methods from here.



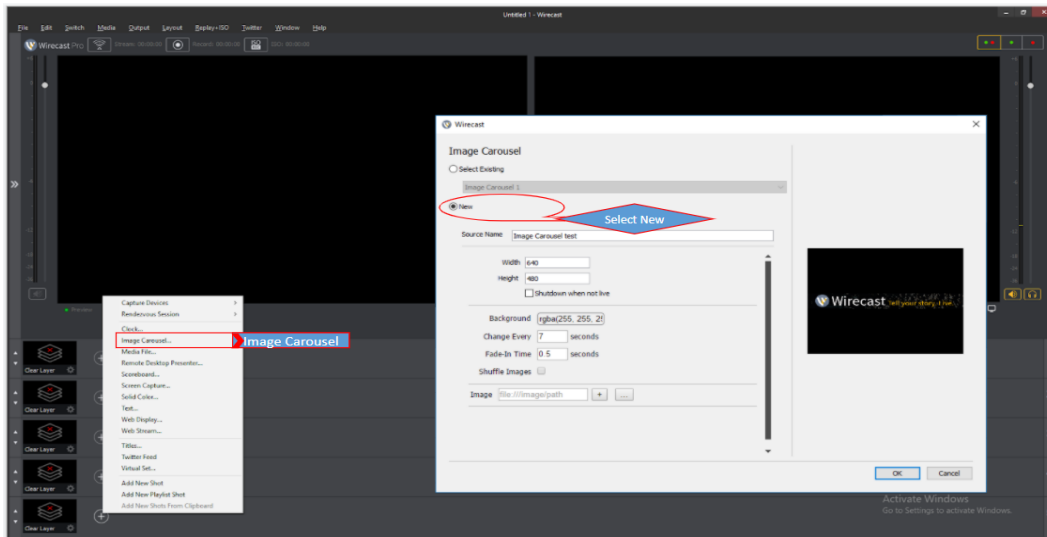
Also, you have an option to get an advance called Stopwatch. If you are participating in a competitive event, this feature will be advantageous.



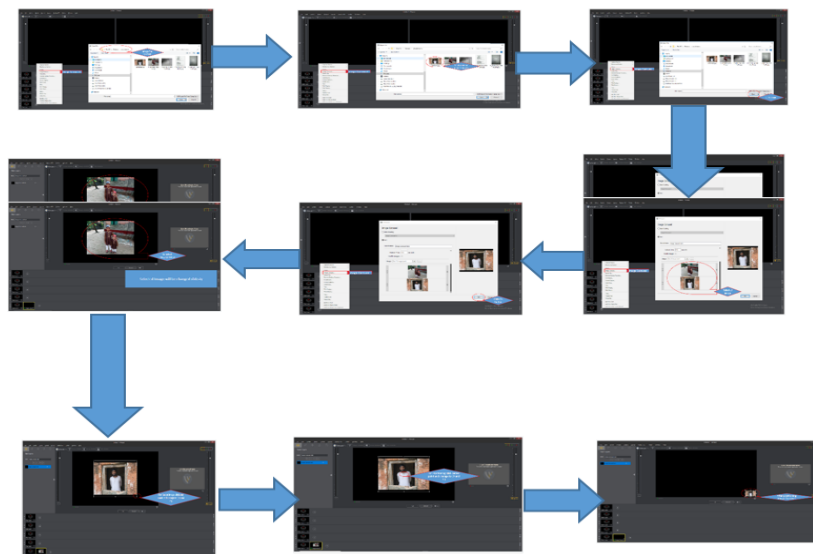
**Figure: 1.26 Countdown Timer**



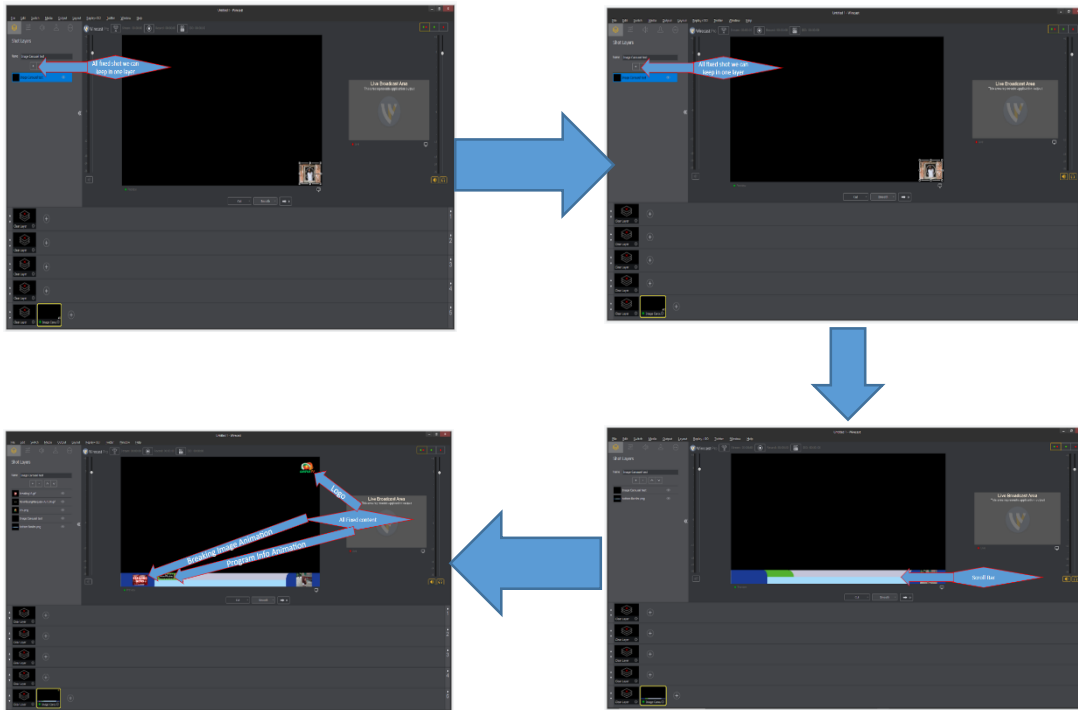
Image Carousel is a function that enables you to showcase a sponsor's logo or a special offer randomly.



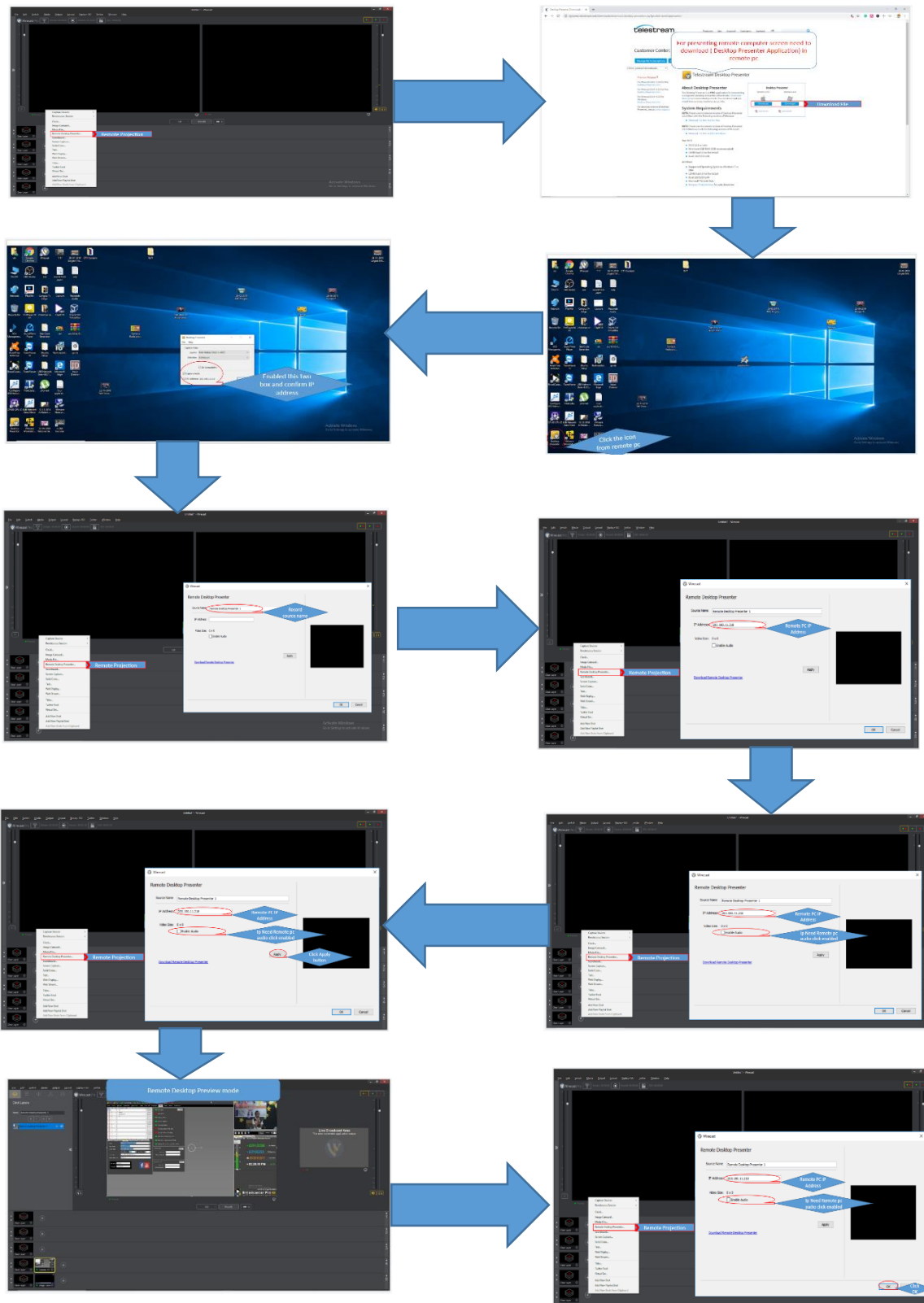
You may utilize the height and width settings to control the display of the Image Carousel at a certain ratio. If you do not enlarge this carousel picture, you may do so by placing your mouse cursor over it.



**Figure: 1.27 Image Carousel processing**



**Figure 1.28 Production Layer Unit**



**Figure: 1.59 Network Content Source**

## **CONCLUSION:**

Campus TV is a prominent Internet TV station in Bangladesh Educational Institute. I'm incredibly happy to be working in this company. I learnt an alot on Campus TV. Everyone was incredibly kind. Whenever I requested information, they happily obliged. They simplified things for me. I learnt how to setup and operate a streaming server as well as the tools needed to provide streaming video to users. I was worried about how I would be received before coming to Campus TV since I had never been there before. But thereafter, everything seemed incredible. For all I know, IT-experienced individuals aren't too helpful. They simply do their own job. Or you may discover newer saying. However, Campus TV's reporters, presenters, editors, and IT experts are exceedingly polite and helpful. They let me know what I desired. Getting experience in a TV channel is the chance to learn about electronic media. That really is an impressive accomplishment.

At last I can say, it was my great opportunity. I enjoyed my internship period in Campus TV. I learned lots of factor and gain many professional knowledge during this period. I think it will be help in my future career.

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# PLAGIARISM REPORT

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[Yuheng Li, Yiping Zhang, Ruixi Yuan, "Measurement and analysis of a large scale commercial mobile internet TV system", Proceedings of the 2011 ACM SIGCOMM conference on Internet measurement conference - IMC '11, 2011](#)

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