

VARD

(Video Archiving, Recording and Distribution Application)

A complete media repository and distribution solution



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Introduction

VARD is the ideal solution for storing, recording and monitored distribution of videos over the internet. The application is designed to optimize distribution to authorized users using comprehensive and secure streaming protocols. The application is designed to handle all live video features from initial recording to uploading to a streaming server and authentication access from users.

Who can use this system?

This system is deigned for use by users such as

- Law Enforcement Agencies (LEA) to record interrogation videos and other evidentiary videos and allow distribution to concerned judicial officials and lawyers.
- Organizations needing to distribute lectures, training sessions and / or operating procedures to off site locations and personnel.
- Educational institutes needing to record and release educational sessions to authorized students only. The system can be integrated with existing or planned Learning Management System (LMS) to create a complete virtual educational environment.
- Production, editing and market research organizations to allow secure pre-release distribution of video and other media material.
- Organization requiring off site monitoring for several locations.
- Production and manufacturing facilities requiring constant monitoring which may need to be distributed.

Problem Description

The user required installation at several locations for video recording using available digital cameras. These videos have to be uploaded to a central server and be available for viewing by authorized users only using a standardized format. The number of recording locations may increase and users may have access to one or more videos or other media.

After reviewing these requirements we were able to distribute the problem into three distinct sub problems. The solution aims to resolve each of these problems independently while integrating the solutions to provide a complete solution. The sub problems can be defined as:

1. Allow recording of video and other media from any number of locations while keeping track of location and time of each recording
2. Upload all media to a central repository and allow distribution in a secure environment.
3. All media to be available for viewing purposes to authorized users.

Resolution

The suggested and implanted solution was based on the following:

1. Video and media recording would involve unique key generation for referencing and storing.
2. Uploading and downloading from the media repository would be achieved using secure streaming protocols to ensure complete data privacy and security.
3. Users with authorization to view a particular video would be provided with a Unique Identifier for authorization

Solution Overview

The solution provides complete facilities for uploading, storing and distributing media to users with web access facility. The solution consists to three identifiable modules:

1. VARD Web Application - Web application for viewing
2. VARD Desk Top Application - Desk top module for recording and uploading
3. Back end repository as an Internet Data Center

VARD Desktop Application

The VARD –Desktop Application will be a standalone desktop application that will be deployed at all recording stations.

The application will be provided to VARD as an 'Installshield' Installer on a CD that can easily be installed through a wizard on any computer.

The desktop application will include the following components:

- i) VARD Administrator
- ii) VARD Scheduler
- iii) VARD Recorder component.

VARD Administrator

A module that allows setup of the VARD Recorder and Scheduler and specify configuration options for each user

VARD Recorder

Provides a simple one button interface for a user to record the proceedings, which need to be uploaded, and stop the recording by pressing on the stop button. Once the recording is complete, a simple information dialog box pops up and the file saved is queued for upload in the scheduler.

VARD Scheduler

This module details all the files that have been queued for upload. The Scheduler performs the upload at the time/date specified in the VARD Administrator module. The application user can retry, force upload or delete files from the queue. The Scheduler will allow basic administrative tasks on the queue.

Internet Data Center

A dedicated server in a cluster based environment that serves as a data and media repository for the system. It is developed to be as secure and stable as possible to provide maximum possible uptime while creating a secure online environment. The Internet Data Center is designed to handle all security and stability requirements that are essential to the operations of this system

This includes the following modules, which are accessible only to authorized administrators:

1. **User Management**
Manage users, including all CARD (Create, Edit, Rights and Delete) options. Monitor usage of each user.
2. **Application Management**
Set application options according to requirements
3. **Application Performance**
Tweak application performance settings
4. **Server Administration**
Server Administrative options and management
5. **Reports and Statistics**
Reports and Statistics on application, users and performance

System Overview

A basic summary of the required system is detailed as follows:

Recording of Videos:

- System will auto-generate key identifier based on a hash of network card and current date/time.
- The Unique identifier will be displayed before, during and after the recording.
- Recording will be initiated by clicking a button on the Recording and Encoding Server.
- Recording will stop by clicking on the same button again.
- A recording indicator will blink to assure the recorder that the recording process has started.
- Recorded video will be encoded and saved to local hard disk. The video will be scheduled for upload at a specified time.
- Video is uploaded to data center after recording at varying speeds.
- Authorized users can view the video at any time by entering the Unique ID of the video.
- Each recorder will store one month's worth of content on the unit.

Internet Data Center:

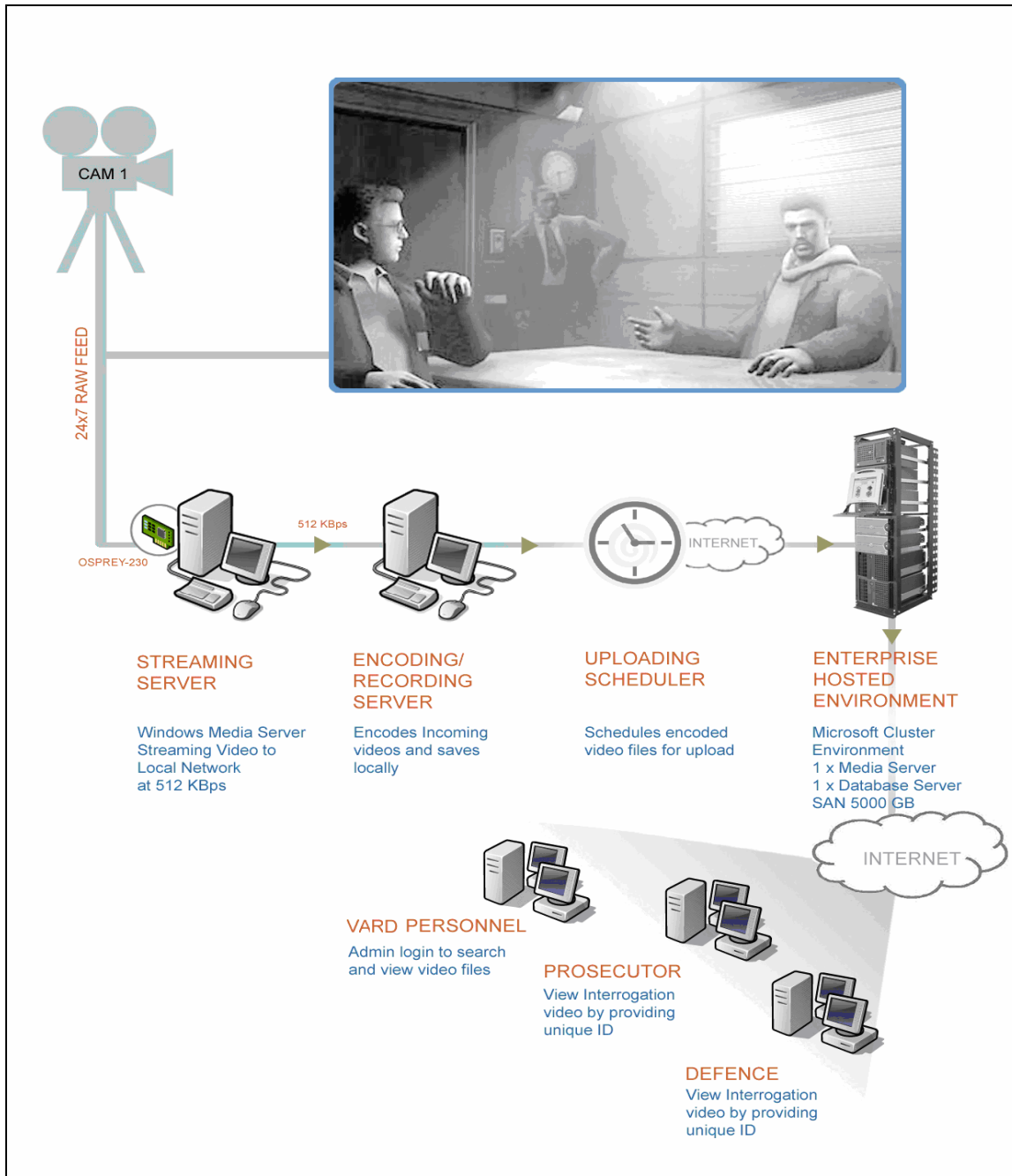
- An Internet datacenter will be created setup using Microsoft Clustering.
- 1 Dedicated Server setup for Internet Information Server (IIS)
- 1 Dedicated Server setup for MS SQL Server database
- 1 Dedicated Server for SAN fileserver.
- SAN with at least 5 Terabyte of disk space to support 20,000 hours of video.
- Webserver must be available 24 x 7 x 365 with a 99.999% uptime.

Viewing of Videos:

- A user will enter a unique identifier to access the video linked with that UID.
- An advanced user (VARD personnel and/or court personnel) may search videos based on date, time and recorder unit in the database and have a list displayed on all relevant video based on search category.
- Each time a video is viewed, details are logged in the database.
- Users will have the ability to download the video locally to their machines.

System Architecture

The following system architecture depicts the complete VARD (Video Archiving, Recording and Distribution Application) and the supporting web application.



Scalability and Modularity

VARD is designed and developing using a Rational Unified Modeling Language. This industry accepted application development protocol has allowed us to develop an application that is highly stable and secure as all its modules undergo rigorous performance and stability testing before integration into the application.

Modular design and development allows easy upgrades and fixes to any aspect of the application. This also allows easy customization to engineer the application to the exact requirements of each client without compromising the integrity of the application.

Scalability for the application can be measured in various dimensions:

1. Load scalability - Distributed system make it easy for us to expand and contract the resource and hardware pool to accommodate heavier or lighter loads. Hence the application is able to perform at optimum levels independent of the user load.
2. Geographic scalability - Geographically scalable system maintains its usefulness and usability, regardless of how far apart its users or resources are. Being a distributed web based application; users are able to perform all tasks regardless of geographical location.
3. Administrative scalability - No matter how many different organizations need to share the single distributed system, it is still easy to use and manage.

Users' Evaluations

VARD has been deployed and is in the use of several major clients. These include:

- Law Enforcement Agencies, based in the United States (State police, District Attorney Office and City Police)
- Law Enforcement Agencies, based in the Europe
- Judicial Organizations in the United States
- Judicial Organizations based in UK

Following are some feedback we have received from users of the system:

"To be able to view testimony remotely has enabled me and my staff to cut time spent previously waiting for client's dispositions or statements in cases where we weren't the principal attorneys. This application saves at least eight to ten hours for each of my staff each week"

Jeff Gladbrook, District Attorney, South Carolina



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