QCloud
Automated Video Content Verification System

Quick Start User Manual

Tektronix

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QCloud Technical Support

To obtain technical support for your QCloud system, send an email to the following address: cerify-support@tek.com.

Contacting Tektronix

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USA

For product information, sales, service, and technical support:
- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

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Preface

QCloud is an automated system for testing compressed digital media before transmission or use. Through a Web-based interface, you can create a Job, which will perform a sequence of checks on a set of media files, and view the results. This manual provides installation instructions and a high-level operational overview of this product.

Product description

This is a media testing product which runs either on a single computer or on a cluster of two or more dedicated computers connected on a network running Microsoft Windows. This automated video content verification system can be used to check for correct digital encoding and against baseband quality parameters. It provides both broadcast and production operations with a fast, cost effective QC solution.

QCloud can be integrated with your existing infrastructure using the CeriTalk API to interface with asset management systems and provide a completely automated workflow. A Web based user interface allows test results to be viewed from any network connected workstation.

System components

QCloud accesses digital media from local storage, such as a local hard drive or DVD, as well as network storage, such as a Windows file server, FTP server, or S3 bucket.

A QCloud system can be set up in three basic ways:

- The first consists of a single self-contained unit which runs all the management and testing processes of the system.

- The second consists of a networked cluster of two or more units, which enables simultaneous processing of a greater number of files. The networked cluster contains a single Supervisor and one or more Media Test Units.

- The third consists of a cluster of three or more units with high availability (HA) support. QCloud Enterprise Cluster with high availability (also referred to as an HA cluster) is a QCloud cluster enabled with support in the case of a Supervisor system failure.

Networking

EC2s (Elastic Computing Clouds) are systems on AWS Cloud. In a clustered configuration, EC2s should be part of a VPC (Virtual Private Cloud). In a clustered configuration, network interface on all of the units, including the Supervisor, secondary Supervisor (HA cluster only) and Media Test Units, should be should be part of the VPC (Virtual Private Cloud). This connection is used to access media files, to service Web clients, and to carry cluster control traffic.
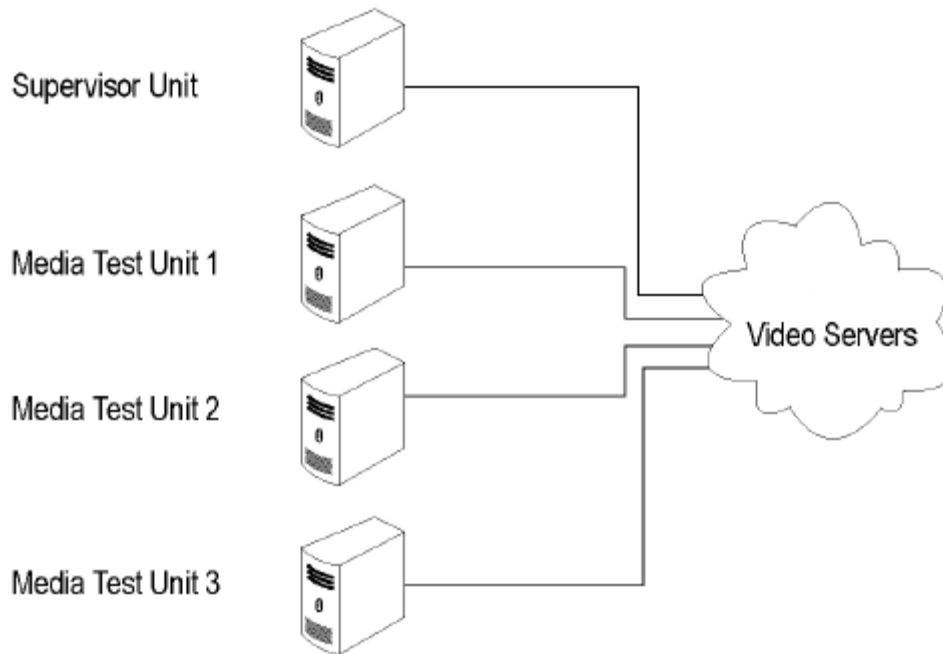

Figure i: Clustering topology

Software components

Software components include:

- A Web-based user interface, which allows users to create and control Jobs, and to view or report the results of these Jobs. This interface is accessed over the network by using a Web browser. All you need to know is the IP address of your computer.

- Media test service, which performs media file verification according to the rules you choose.

- A database, which provides robust storage of the system entities, including users, Jobs, and Job results.

- An XML-based control and reporting API known as CeriTalk. CeriTalk allows interaction with QCloud from within other applications, making it possible to integrate QCloud with other content management, broadcast automation, and workflow systems.

- A Web application server that provides access to the Web interface and runs the core services for the application.

■ A license server, which controls the types of files that can be processed and tracks usage of the various features.

■ The system tray icon and menu, which provides access to the QCloud Web-based user interface and allows the application to be started and stopped. The system tray icon is not available when QCloud is installed as a Windows service.

QCloud as a standalone system

A standalone system is a single machine that combines the functions of a Supervisor unit and a Media Test Unit. The process that carries out the media file testing is known as the Media Test Client (MTC).

QCloud enterprise cluster

The Supervisor unit controls the cluster system. It hosts the database and the Web server, allowing multiple users to set up and view Jobs. It is responsible for locating the media files from the network, but delegates actual transfer and processing of these files to one or more Media Test Units. The Supervisor unit organizes and stores the resulting outputs.

Each Media Test Unit is responsible for processing the digital media files in a networked cluster. It applies the user-specified tests, and reports back the results. The Supervisor can also be configured to process the files.

On an AWS Cloud, the following configurations are required for a QCloud enterprise cluster to function:

Security groups configuration within a VPC for QCloud

A security group is a firewall that regulates the flow of traffic across the EC2s within a VPC network on Cloud. Each EC2 can be associated with a particular available security group. The security group contains a set of rules that allow or disallow inbound and outbound traffic to those EC2s. Multiple security groups can be configured within a VPC. The security group should be configured in such a way that it allows both inbound and outbound traffic across a cluster of EC2s. At the same time, it secures the systems from external communication.

Example configuration of a security group

In the EC2 management console, open EC2 dashboard. Click on the "Security Groups" option under the "Network and Security" section. This will list down all the available security groups. Note that this list displays the "Group Id" for each of the security groups. Select the security group to be updated with the rules. The lower panel will display the security group details.

How to set inbound rules. The following procedure shows you how to set inbound rules.

1. Select the "Inbound" tab.

2. Select "Custom TCP rule" from the "Create a new rule" selection box.

3. In the "Port Range" text box, enter 0-65535. This will open up all available ports on TCP.

4. In the "Source" text box, enter the ID of the security group. Each security group will come with an id assigned to it in the form E.g.-<abcd1234>. This is same as the one displayed under "Group Id" column mentioned above for this security group.

5. Setting Outbound rules: 1: Select the Outbound tab. 2: Select "All TCP rule" from the "Create a new rule" selection box. 3: In the "Source" text box, enter 0.0.0.0/0 Basically this rule allows all TCP traffic between the EC2s that are associated with this security group. Also, this allows all traffic from the EC2 to the outside.

How to set outbound rules. The following procedure shows you how to set outbound rules.

1. Select the Outbound tab.

2. Select "All TCP rule" from the "Create a new rule" selection box.

3. In the "Source" text box, enter 0.0.0.0/0 Basically this rule allows all TCP traffic between the EC2s that are associated with this security group. Also, this allows all traffic from the EC2 to the outside.

QCloud high availability enterprise cluster

The QCloud high availability enterprise cluster (also referred to as an HA cluster) is a QCloud cluster enabled with support in the case of a Supervisor system failure. In an HA cluster, one of the member units of the cluster is configured as a backup to the Primary Supervisor and is called the Secondary Supervisor.

If QCloud on the Primary Supervisor goes down for any reason (for example, due to a machine crash), the Secondary Supervisor automatically takes over and manages the cluster. All other units (MTUs) now form a cluster with the Secondary Supervisor. Once the Primary Supervisor recovers, it will assume the role of the Secondary Supervisor and will be ready to take over when the current Supervisor goes down.

The Secondary Supervisor is a part of the HA cluster and can also process files like the Primary Supervisor and the MTUs in the cluster while performing the job of a Secondary Supervisor.

In an HA cluster, it is mandatory to attach an additional network interface for the EC2 that acts as Primary supervisor prior to installation. The private IP of this additional attached network interface should be used for communication (Ceritalk/Web UI). The private IP address of primary network interface (which is pre configured with an EC2) should be used for QCloud cluster communication.

When starting an HA cluster, the cluster units should be started in the following order:

1. Primary Supervisor

2. Secondary Supervisor

3. Media Test Units: these should be started one by one after both the Primary Supervisor and Secondary Supervisor are started

Cloud level and EC2 level configurations required before installation of the HA cluster units

The following are the configurations that need to be in place before QCloud is installed on EC2 systems.

1. Define IAM role in the Amazon AWS Cloud console as follows:

    a. In the console, get the IAM dashboard.

    b. Create a new role using the "create new role" option in this page.

    c. Select this newly created role and create a new policy for this role. For this, select the new role created above and click on Attach Role Policy button at the bottom of the dashboard. In the UI that comes up, select "Custom Policy" option and click on Select next to it. In the Set Permissions window, enter a name for this policy and copy the below lines in the "Policy Document" text box.

    These lines set the permission for QCloud to attach and detach network interface which is required for the functioning of HA and access of web UI using the single Ceritalk IP address even after fail over.

    { "Version": "2012-10-17", "Statement": [{ "Action": ["ec2:AttachNetworkInterface", "ec2:DetachNetworkInterface"], "Effect": "Allow", "Resource": "*" }] }

    d. Click on "Apply Policy" button and this policy will now be displayed under the "Permissions tab".

2. Create EC2 instances with the IAM role attached as follows:

    a. After setting up the IAM role mentioned above, now the user should proceed to create EC2 instances required for the HA cluster. During the creation of the instance, an option is provided for the user to select the IAM role. This will be a drop down control that will display all the configured IAM roles. The user should select the IAM role that has the above policy created in it and proceed creating the EC2 instance. Please note: The IAM role cannot be attached to an existing instance if it is not attached during the creation of the instance. Hence, the IAM role with the mentioned policy has to be created before creation of the EC2 instance and attached to the EC2 during the creation of instance.

3. Create an external network interface and select IP addresses during the installation of the Primary Supervisor as follows:

    a. The HA cluster requires at least 2 Network Interface Cards to be present on the system where primary supervisor is installed before the start of the installation of QCloud. This second network interface card should be an externally added network interface after the creation of the EC2 instance and before starting QCloud installation on Primary Supervisor. While creating the external network interface, it is possible to assign an IP address of your choice as private IP address for that network interface.

    b. The interface that comes along with the EC2 instance during EC2 creation is called the primary network interface card. The private IP address associated with this interface should be selected as the network interface for cluster formation during the installation of the QCloud Primary Supervisor in the Supervisor settings installation screen.

    c. The private IP address associated with the externally attached network interface card should be selected for the Ceritalk\web UI communication during the installation of QCloud primary supervisor in the Supervisor settings installation screen.

4. Update hosts file with IP Address and hostname combination as follows:

    a. The IP address and hostname combination have to be updated into the hosts file for the IP address resolution during cluster formation. This detail of all the units in the cluster needs to be updated into the hosts file of primary and secondary supervisor. The details of primary and secondary supervisors need to be updated into the hosts file of all the MTUs. The hosts file is found in c:\windows\system32\drivers\etc folder. Please note: This should be the cluster formation IP address and not the Ceritalk\web UI communication IP. This will be the IP address selected for cluster formation during the installation.

Clustering requirements

A cluster is a network of two or more units, which enables simultaneous processing of a greater number of files. The networked cluster contains a single Supervisor and one or more Media Test Units.

The Supervisor unit controls the cluster system. It hosts the database and the Web server, allowing multiple users to set up and view Jobs. It is responsible for locating the media files from the network, but delegates actual transfer and processing of these files to one or more Media Test Units. The Supervisor unit organizes and stores the resulting outputs. The Supervisor can also be configured to process the media files.

The Media Test Unit is responsible for processing of the digital media files in a cluster. It applies the user-specified tests and reports results the back to the Supervisor unit.

To set up a cluster, install Media Test Units and Supervisor on the respective nodes.

Clustering requirements

- Two or more systems with 64-bit Windows Server 2008 SE OS installed.

- Administrator privileges on all the machines on which the QCloud software will be installed.

- All of the systems with QCloud installed need to meet the minimum hardware specifications.

- All of the clustering systems, Media Test Units, and Secondary Supervisor unit should reside on the same network (VPC) as the Supervisor unit. It is recommended that each cluster unit be configured with Static IP addresses.

- All of the systems in the cluster should be able to route to each other. The Supervisor unit and the Secondary Supervisor unit (in the case of an HA cluster) each need to be given a network name that is recognized and resolved by all of the units in the cluster.

- You should know the NetBIOS name of the Supervisor unit and the Secondary Supervisor unit and provide these when the installer of the other units in the cluster asks for the names of the Supervisor and Secondary Supervisor units.

- Time synchronization between all the units in cluster must be maintained. For example, use an NTP server to synchronize the units in a cluster.

- All the units in the cluster should be configured to be in the same time zone.

Clustering scenarios that may not work

Clusters may not work in the following scenarios:

■ If a Media Test Unit or Secondary Supervisor cannot resolve Supervisor host name.

■ In the case of an HA cluster, if the Supervisor can not resolve the host name of the Secondary Supervisor and vice versa.

■ If the Supervisor does not have a host name or if the Supervisor has a host name with Japanese or Chinese characters.

■ If a network has another system with the same host name as the Supervisor (or Secondary Supervisor) system.

■ If the host name of the Supervisor (or Secondary Supervisor) changes after cluster installation.

■ If the http port on the Supervisor is configured to a different port number after cluster installation. In this case, the property cerify.supervisor.httpport in the system.properties on the Media Test Units must be changed to the new port number.

■ If the http port on the Supervisor is configured differently than that of the Secondary Supervisor.

■ If the private IP addresses of any units in the cluster change after the installation. In this case, the property cerify.jboss.bindaddress must to be changed to the current IP address.

■ In the case of a normal (non-HA) cluster, if the Supervisor has multiple network interfaces connected to the same network and if DNS/WINS are not configured properly, troubleshoot this problem by adding an entry containing the Supervisor host name and the IP address used by QCloud on Supervisor in "hosts" file, which can be found in `C:\WINDOWS\system32\drivers\etc` in all the Media Test Units.

Related documentation

The following documents are available:

■ QCloud Online Help

■ QCloud User Manual (Tektronix part number, 077-0943-xx)

■ QCloud Release Notes (Tektronix part number, 077-0941-xx)

■ QCloud Third Party Software License Notice Document (Tektronix part number, 001-1653-xx)

Installation

Before installation

Network connection

Before installing the QCloud application, your computer must be correctly connected to your local network.

This allows the following:

- The QCloud application to test the files that are available on other machines on the network.

- Other machines to interact with QCloud automatically (for example, using CeriTalk automation clients, copying of report files to network locations, or using email).

- Multiple users to connect to the QCloud Web user interface from remote computers.

For the last two cases, you need to know the IP address or the network name of the machine on which QCloud is installed. Network settings on the computer are configured in the usual manner using Windows. If your machine is not properly configured or you do not know the name or IP address information, contact your system administrator.

Hardware prerequisites

QCloud is designed to be run on a variety of hardware. Consequently, the choice of hardware is determined by performance and throughput requirements for your installation.

This section recommends hardware configuration for some situations in which QCloud is typically used.

QCloud can be installed as either of the following two configurations on a given computer:

QCloud can test one or more media files at a time on a single unit. Due to the high throughput and performance requirements that are expected from such installations, it is recommended that server class hardware and operating systems be used in such cases.

In addition to the throughput required, the hardware requirements also depend heavily on the mode of operation that will be used. QCloud can operate in two modes:

- Streaming mode

  In this mode, media files are read directly from the media server hosting the file and are not copied to the local hard disk of the QCloud system.

- Copying mode

  Media files are copied to the local hard disk of the QCloud system. Processing begins as soon as sufficient data are available.

The mode of operation that applies to your QCloud installation depends on the file formats you would like to test and other work flow and connectivity related constraints that might apply to your situation.

The functional differences between these two modes of operation impact primarily on the disk space availability and disk configuration requirements. Specifically, the copying mode requires a greater amount of disk space and high levels of concurrent read/write performance from the hard drives in order for best overall performance while the streaming mode can derive comparable overall performance with a lesser amount of disk space and lower read/write efficiency.

The general guidelines that should be followed when selecting hardware are:

■ Processor: 3 GHz

QCloud is capable of using as many processor cores as available for improved processing performance. While the minimum required configuration is 1 core per channel, for optimum performance, it is recommended to allocate between 4 and 6 processor cores per QCloud channel. It is also recommended that for best performance, you choose as much on-chip memory cache as possible.

NOTE. QCloud is optimized for Intel processor architectures, and therefore it is recommended to use an Intel based server platform.

■ Memory:

It is recommended to use a minimum of 4 GB of RAM per channel and an additional 4 GB for the operating system and the QCloud database. For optimum performance for 4 channels, the recommended memory therefore is: 4 x 4 GB (per channel) + 4 GB = 20 GB. When the expected load in QCloud is likely to be largely composed of huge media files, more memory per channel may be necessary.

■ Hard disk drive:

It is recommended to configure 500 GB of EBS storage for QCloud to work optimally. The installation of QCloud should be done on this EBS storage where the QCloud database also resides.

The amount of additional storage you need depends on the mode of operation that applies to your installation, the average size of the files you will be processing and the number of simultaneous files being processed. It does not need to be persistent storage, so you can use EC2's Ephemeral Storage when it is available.

  − Streaming mode

  Due to the minimal hard disk utilization when operating in the streaming mode, it is sufficient to provide a disk space of 100 GB in size as temporary storage for QCloud.

  − Copying mode

  The minimum disk space provided must be greater than the average file size being processed multiplied by the number of channels.

■ Network interface: 1 Gbit/s

Supported platforms

■ Windows Server 2008 64-bit

■ Windows Server 2008 R2 64-bit

NOTE. QCloud is expected to operate correctly on other variants of Windows as well, but it has been qualified only on the ones specified above.

Software prerequisites

The computer on which the application is installed will need the following:

- To run one of the supported platforms.

- To access the system through its Web user interface from another computer on the network, the client computer must have a Web browser installed.

NOTE. *To access the application, the preferred Web browser is Microsoft Internet Explorer (version 7.0 and 8.0). The application has also been tested with Mozilla Firefox. There may be minor visual differences in the appearance of the user interface in different Web browsers.*

Software installation

The installation of the QCloud application takes several minutes; typically between 5 and 15 minutes depending on the speed of your computer.

Before installing QCloud, you should be aware of the following information:

- It is recommended that the QCloud application be installed on a machine where it can be used as the sole running application. QCloud makes intensive use of both CPU and memory and will considerably degrade the performance of other running applications. Similarly, running other applications or services simultaneously will degrade the performance of QCloud and increase the time taken to process a media file.

- QCloud relies on third-party software applications that are packaged and installed with it: JBoss and MySQL. If these applications are already used on the computer, you should remove them before attempting to install the QCloud.

- QCloud uses a number of network services that are local to the host computer. These services can sometimes be blocked by personal firewall software, in which case an error message will be displayed when QCloud starts.

  In such situations, configure the firewall to allow the service on the appropriate port, or alternatively disable the firewall entirely.

- An installation log is written to the "%userprofile%\QCloud\QCloudInstallationLogs_<Timestamp>" folder. This log gives details of selections you made during the install and any errors encountered in case of failure to install.

- QCloud should be installed on a EBS location.

- While choosing the location for storing temporary video files during installation, make sure that there is sufficient free space in this folder to store large video files. EC2's Ephemeral Storage can be used to store temporary video files.

- QCloud uses the computer name (as stored in the environment variable named "COMPUTERNAME") to uniquely identify some of its network services. This will not work if non-ASCII characters are used in the computer name.

- QCloud will fail to run if any other Web services using port 80 are running on the system where the QCloud is installed (for example, the IIS Admin service, Skype or Apache). You can run QCloud once you shut down the other port 80 services running on the system. Alternatively, you can configure the QCloud Web port to use a port other than 80.

- It is not possible to install a lower version of QCloud when you have a higher version of QCloud already installed. For example, if you install QCloud version 7.7 and then you want to go back to QCloud version 7.6, you will need to first uninstall QCloud 7.7 and then install QCloud 7.6.

Installing QCloud

The installation of the QCloud application takes several minutes; typically between 3 and 5 minutes depending on the speed of your computer.

To install QCloud, you need to perform the following steps:

1. Run the QCloud Installer.

2. *Optional*: Install Apple QuickTime Player. If QCloud is running while Quicktime Player is installed, you will need to restart QCloud for Quicktime player to be available to QCloud for file processing.

Running the QCloud installer.

■ Ensure that you are logged in as a user with administrator privileges.

NOTE. If you try to install the QCloud application without administrator privileges, the following message appears: "The QCloud application can be installed or uninstalled only by a system administrator. Please log in as administrator and try again".

■ Copy the QCloud installer (QCloudSetup<version>.exe) onto the EC2 where QCloud needs to be installed. You can download the installer from the Tektronix web site from the EC2 itself. Double click on the copied installer file. Follow the on-screen instructions to perform the installation.

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*NOTE. If you try to install the QCloud application on an unsupported platform
(refer to Supported Platforms(See page 2, Supported platforms.)), then the following message appears: "This is not a supported Windows operating system. QCloud will probably operate correctly but has not been validated on this OS. Do you wish to continue installation?"*

A number of third party software applications are installed during the installation process. Most of these are not visible, but you will be notified as the WinPcap is installed.

NOTE. WinPcap is not used in the normal operation of the QCloud application. It is used when you collect support diagnostics to troubleshoot networking issues with QCloud. For more information on support diagnostics, refer to Capturing QCloud Status Information Using the Support Monitor Script in the QCloud Help.

Installation options

QCloud can be installed in the following ways:

■ Standalone

■ Supervisor (for an Enterprise cluster): The Supervisor unit controls the cluster system. It hosts the database and the Web server, allowing multiple users to set up and view Jobs. Use this option to install the Supervisor for a normal cluster (without high availability support).

■ Media Test Unit (for an Enterprise cluster): Each Media Test Unit is responsible for processing the digital media files in a networked cluster. Use this option to install Media Test Units for a normal cluster (without high availability support).

■ Supervisor (for an HA cluster): Use this option to install the Primary Supervisor for an HA (high availability) cluster.

■ Secondary Supervisor (for an HA cluster): Use this option to install a Secondary Supervisor for an HA (high availability) cluster, which will act as the Primary Supervisor if the Primary Supervisor system goes down.

■ Media Test Unit (for an HA cluster): Use this option to install Media Test Units for an HA (high availability) cluster.

NOTE. During the installation of QCloud, if there are multiple network interfaces in the system, the installer provides the list of IP addresses and asks the user to select the IP address to be used by QCloud.

While installing the Supervisor and the Secondary Supervisor (in the case of an HA cluster), the installer also provides the option to select the IP address for communication (such as the IUP address used for communicating with QCloud through either Ceritalk or the Web user interface). Make sure to choose the IP address of the additional attached network interface for this purpose. Do not select the IP address of the primary network interface that came with EC2 by default for communication.

The installer also provides an option to install QCloud as a service. This option is selected by default. If you want to install QCloud in application mode, this option needs to be deselected.

Installing QCloud as a Supervisor.   Follow the steps described in Run QCloud Installer(See page 4, *Running the QCloud installer*.) and Installing QCloud(See page 4, *Installing QCloud*.) to install QCloud as a Supervisor. During the installation, a dialog box appears with the list of installation options.

To continue with the Supervisor installation for a normal Enterprise cluster, select **Supervisor** under the option "Enterprise Cluster" in the installation options dialog box.

To install the Supervisor for an HA cluster, select **Supervisor** under the option "High Availability Enterprise Cluster" in the installation options dialog box.

During the installation, a dialog box appears where you must:

■ Specify the Customer Reference ID.

■ Choose the IP address to be used by QCloud.

■ Choose the IP address to be used for all QCloud communication. This option is available only while installing the Supervisor for an HA cluster.

■ Enter the host name of the Secondary Supervisor. This option is available only while installing the Supervisor for an HA cluster.

■ Enter the host names or IP addresses for all the Media Test Units.

Installing QCloud as a Secondary Supervisor.   Follow the steps described in Run QCloud Installer(See page 4, *Running the QCloud installer*.) and Installing QCloud(See page 4, *Installing QCloud*.) to install QCloud as a Secondary Supervisor for an HA cluster. During the installation, a dialog box appears with the list of installation options.

To continue with the Secondary Supervisor installation, select **Secondary Supervisor** under the option "High Availability Enterprise Cluster" in the installation options dialog box.

During the installation, a dialog box appears where you must:

■ Choose the IP address to be used by QCloud.

■ Choose the IP address to be used for all QCloud communication.

■ Enter the host name of the Supervisor.

■ Enter the host names or IP addresses for all of the Media Test Units.

Installing QCloud as a Media Test Unit. Follow the steps described in Run QCloud Installer(See page 4, *Running the QCloud installer*.) and Installing QCloud(See page 4, *Installing QCloud*.) to install QCloud as a Media Test Unit. During the installation, a dialog box appears with the list of installation options.

To continue with the Media Test Unit installation for a normal Enterprise cluster, select **Media Test Unit** under the "Enterprise Cluster" option in the installation options dialog box.

To continue with the Media Test Unit installation for an HA cluster, select **Media Test Unit** under the "High Availability Enterprise Cluster" option in the installation options dialog box.

During the installation, a dialog box appears where you must:

- Enter the host name of the Supervisor.

- Enter the host name of the Secondary Supervisor. This option is available only while installing Media Test Unit for an HA cluster.

- Choose the IP address to be used by QCloud.

Configuring a non-HA cluster. To configure a non-HA cluster, you must:

- Install QCloud as a Supervisor on the system which must be configured as supervisor of the cluster.

- Install QCloud as a Media Test Unit on one or more systems.

When installing QCloud as a Media Test Unit, the installer prompts you to enter the Supervisor host name.

You can also configure multiple clusters on the same network. To configure multiple clusters on the same network, you need to install multiple Supervisors. During a Media Test Unit installation, in the QCloud System Settings dialog box, you must enter the respective Supervisor host name.

*NOTE. To configure a cluster, the versions of QCloud on the Supervisor and the Media Test Unit should be the same. Once the installation is complete, QCloud will be started on both the Supervisor and the Media Test Unit. Access Supervisor using QCloud Web UI and navigate to the Admin page, click the **Media Test Units** link to the page containing the list of Media Test Units.*

Configuring an HA cluster. To configure an HA (high availability) cluster, you must:

- Install QCloud as a Supervisor by choosing **Supervisor** under the "High Availability Enterprise Cluster" option on the system that is to be configured as the Primary Supervisor of the cluster.

- Install QCloud as a Secondary Supervisor by choosing **Secondary Supervisor** under the "High Availability Enterprise Cluster" option on the system that is to be configured as the Secondary Supervisor of the cluster.

- Install QCloud as a Media Test Unit by choosing **Media Test Unit** under the "High Availability Enterprise Cluster" option on one or more systems.

When installing QCloud as a Media Test Unit for an HA cluster, the installer prompts you to enter the host names of the Supervisor and Secondary Supervisor systems.

NOTE. To configure an HA cluster, the version of QCloud that is installed on the Supervisor, Secondary Supervisor, and the Media Test Units should be the same. Once the installation is complete, QCloud will be started on the Supervisor, Secondary Supervisor, and the Media Test Units. Access the Supervisor using the QCloud Web UI and navigate to the Admin page. Click the Media Test Units link to the page containing the list of Media Test Units.

Installation folders.   During the installation process, select the following locations:

■   **Installation location**: The folder where the application is installed. You will need to choose an EBS location as the installation location. It is possible to install QCloud on the root drive on an EC2 because the root drive of a Windows EC2 instance is always on EBS. But the default root drive has only 30 GB of disk space, which may not be enough for QCloud installation (which also includes the database). Therefore, it is recommended to install QCloud on an EBS location that has at least 500 GB of disk space.

■   **Temporary storage location**: Before processing media files from an external server, QCloud may need to copy the remote files to the computer on which the QCloud application is installed. This folder is used as the location to store such temporary copies. QCloud copies the file only when operating in copy mode and accesses the file using the ftp://, smb://, or s3:// protocols.

NOTE. There should be sufficient free space in the temp folder to store large video files. The location for this temp folder can be on EC2's ephemeral storage.

If you would like multiple users to be able to run the QCloud application on the computer, make sure to select a location that has read and write permissions for those users. A temporary directory located within a users private directory is not suitable in this case.

By default, the number of files that can be simultaneously processed by QCloud is computed as follows:

1. This will be minimum of (RAM – 4) / 4 and "(number of logical processers-1)/2".

2.   For supervisor and secondary supervisor, the number of files that will be processed simultaneously will be 20% less than the above computed value.

3. For any QCloud instance, if computed values become equal to 0, then only one file can be processed at a time.

The installer displays the default number of files that will be processed simultaneously for different modes of installation on one of the screens.

Sometimes, you may need to change the number of files that can be simultaneously processed by QCloud. You can change this by editing the value of the property "cerify.processorsperbox" in the "system.properties" file located at `<Installation Directory>/JBoss/server/all/conf`.

NOTE. The value for the cerify.processorperbox property can not be greater than the minimum of (RAM-2)/2 and (number of logical processors-1). If you configure a greater value, then QCloud will default the number of files to be processed simultaneously to the minimum of (RAM-2)/2 and (number of logical processors-1). If you want to disable processing on Supervisor and Secondary Supervisor, then you will need to set the value of property of cerify.processorsperbox to -1.

Install Apple QuickTime player.

To process Apple ProRes files or to process files using the Generic QuickTime Video template you have to install QuickTime Player. You can download QuickTime player from the link http://www.apple.com/quicktime/download/.

NOTE. If QuickTime Player is already installed, make sure that it is version 7.5.5 or later.

Uninstalling software

Before uninstalling the software, ensure that you have administrator privileges. If you try to uninstall QCloud without administrator privileges, the process will be aborted.

QCloud can be uninstalled in two ways:

- Through **Start** > **Control Panel** > **Add or Remove Programs**.

- By rerunning the **QCloudSetup<version>.exe** that you used to install the current version and following the on-screen instructions.

NOTE. If the QCloud installer version is higher than the currently installed version, the installation will be upgraded to the newer version.

If the QCloud installer version is lower than the current installed version, the installer will abort without taking any action.

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*NOTE. The QCloud installation process places the WinPCap utility in the **Add or Remove Programs** list. The uninstallation process does not remove WinPCap in case it is being used by other programs or you want to continue to use it for other purposes. If you want to uninstall WinPCap, this can be done in the usual way from the **Add or Remove Programs** list.*

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*NOTE. If you select the **Backup database** option during uninstallation, the current database will be backed up to `C:\Documents and Settings\<username>\QCloud\QCloudBackup_<version>_<timestamp>`. You are given the option to change the directory where you want to back up the database. All relevant configuration files will be backed up to `C:\Documents and Settings\<username>\QCloud\QCloudConfig_<version>_<timestamp>`. The "Backup database" option will not be available if you are uninstalling the Media Test Unit, as the Media Test Unit does not have its own database.*

Uninstalling a cluster

To uninstall a cluster, do the following:

- Uninstall QCloud on the Supervisor.

- Uninstall QCloud on the Secondary Supervisor (in the case of an HA cluster).

- Uninstall QCloud on all of the Media Test Units.

Refer to the Unstallling software section for instructions on uninstallation.

Software reinstallation

To reinstall QCloud, you must uninstall QCloud, and then rerun the installer. Rerunning the installer that was used to install the current version of QCloud will cause QCloud to be uninstalled. It does not repair the existing installation.

Software upgrade

To upgrade your existing version of QCloud to the latest version, run the setup file for the latest version of QCloud and follow the on-screen instructions.

It is possible to upgrade any type of QCloud installation to any other QCloud installation type (for example, upgrading a Media Test Unit to a Supervisor).

If you would like to back up the current database while you are upgrading from Supervisor, Secondary Supervisor, or Standalone QCloud, choose the **Backup database** option during the upgrade process. The current database is backed up to the location `C:\Documents and Settings\<User name>\QCloud\QCloudConfig_<version>_<timestamp>` by default. You may change this location by choosing a different folder for backing up the files.

The upgrade process also backs up relevant configuration files from the current installation. These files are backed up to `C:\Documents and Settings\<User name>\QCloud\QCloudBackUp_<version>_<timestamp>`.

When you are upgrading to a Supervisor or standalone QCloud, the database is upgraded automatically after the installation. If the database upgrade fails, the installer will install QCloud with a clean database and inform you about the failure. The **Backup database** option will not be available while upgrading from Media Test Units, as they do not have their own database.

Upgrading a cluster

The following list provides information about upgrading a cluster.

- Upgrade QCloud on the Supervisor by running the latest version of installer and choosing Supervisor as installer type. You can upgrade to either Supervisor for a normal Enterprise cluster or to Supervisor for an HA cluster by choosing the appropriate options.

- Upgrade QCloud on the Secondary Supervisor by running the latest version of installer and choosing Secondary Supervisor as the installer type.

- Upgrade QCloud on all of the Media Test Units by running the latest version of installer and choosing Media Test Unit as the installer type. You can upgrade to either Media Test Unit for a normal Enterprise cluster or to Media Test Unit for an HA cluster by choosing the appropriate options.

Reverting to a previous version

In some circumstances, such as a failed software upgrade, you might want to revert to an older version of QCloud. To do this, follow these steps:

NOTE. You should have a database backup and a copy of configuration files from the version you would like to revert to as a pre-condition.

1. Uninstall the current version of QCloud. While uninstalling, back up the database by selecting the **Backup database** option.

2. Install the older version of QCloud.

3. Restore the database of older version using Database Backup/Restore Utility.

Network settings

NOTE. The QCloud software does no particular configuration of any network interfaces - IP address, netmask, DNS, Net BIOS, etc. These should be set using the usual Windows methods.

Two network interfaces

In most circumstances, the system on which QCloud is installed requires only one network interface. There are three scenarios where it is necessary to have two network interfaces:

■ When the network on which the Web clients will access the Web user interface needs to be physically separate from the network that stores the media file assets.

■ When the QCloud system is to access media files from a Grass Valley Profile or K2 server. In this case, the additional network interface should be connected to the control network that runs the Grass Valley AMP service. This enables QCloud to list the contents available on the Grass Valley servers. The first network interface on the computer should continue to be connected to the video server network as follows:

    – On a standalone Profile XP, to either the Media Ethernet card, if present, or the Ethernet interface of a Universal Interface Module (UIM), if present

    – On a SAN-based Profile XP network, to the Gigabit Media network provided by a Universal Interface Module, if present

    – On a SAN-based K2 network or a standalone K2 Media Client, to the Media/FTP network

    For a K2 network, it is possible to use direct FTP connectivity, in the same fashion as other video servers. In this case, the AMP control network does not need to be accessed and no additional network interface is needed.

■ When installing a Supervisor or Secondary Supervisor for an HA (high availability) cluster. In this case, the second network is used for communication to QCloud via Ceritalk or Web user interface.

Configuring the QCloud installation

See *Appendix E: Configuring your QCloud installation* in the *QCloud User Manual* for information about how to configure your QCloud installation for the best performance.

Operation

Getting acquainted

User interface

The user interface consists of a structured collection of pages accessed using a Web browser. The following figure shows the elements that are common to most of the pages in the QCloud Web user interface. The Jobs Monitor page will not contain any jobs when you login to QCloud for the first time after the installation, but will look similar to the following after you perform the tutorial. The elements of the Jobs Monitor page are shown and described in the following figures and table.
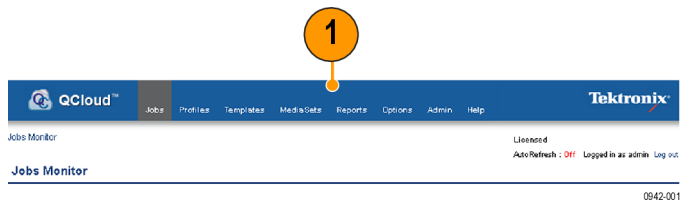
Figure 1: Navigation bar
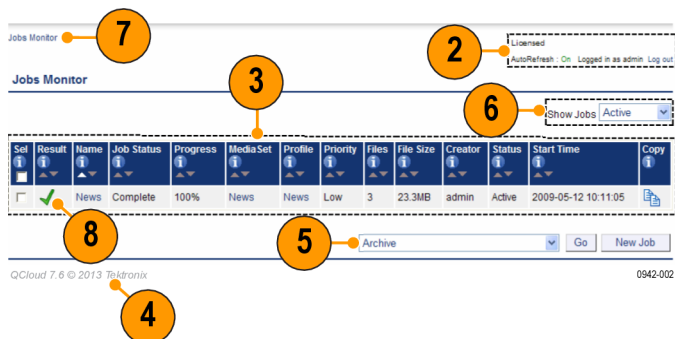
Figure 2: The Jobs monitor page

Item		Description
1.	Navigation bar	The navigation bar provides a quick route to the top level of any of the pages.
2.	Auto-Refresh and login details link	Click Auto-Refresh to On to view update progress and job status. The login details, located below the navigation bar at the top-right section of the screen, show who you are logged in as and provide a link enabling you to log out. The license status of QCloud is also reported in this section.
3.	Tables	The system displays a collection of entities in the form of tables. Several types of entities can be created, edited, and displayed, such as Jobs, Profiles, Templates, MediaSets, MediaLocations, and Users. The role of these entities and the relationship between them is explained later in this manual. (See page 16, *Overview*.)
4.	Footer	The footer displays a copyright notice and version information.
5.	Archive/Restore Control	The Archive/Restore control allows you to archive and restore entities.
6.	Active/Archive View Control	The Active/Archive view control allows you to choose which entities of a particular type to view. *NOTE. When an entity is archived, it is not removed from the database, but it becomes inactive. You cannot construct new entities from inactive entities.*
7.	Trail widget	The trail widget allows you to see your position in the hierarchy and navigate from this position.
8.	Icon	The following table lists the icons used in the interface. (See Table 1.)

Table 1: User interface icons

Icon	Description
	Collapse this section
	Expand this section
	Copy this item
	Remove this item
	Edit this item
	Directory
	File in a directory
	Open a context-sensitive help topic
	Status unknown
	Failed with a fatal error status
	Failed with an error status
	Failed with a warning status
	Succeeded with no errors or warnings
	Item created through the QCloud Web user interface
	Item created through CeriTalk API
	Sort items in this column in descending order
	Sort items in this column in ascending order
	Click this button to trigger the selected action
	Adds another set of values to the rules
	Removes any set of values from the rule

Accessing the online help

You can access help topics by clicking **Help** on the Navigation bar or clicking the ℹ icon.

Concepts

Users

Before using the system, you must log in with your username and password credentials. These credentials are assigned by a user who has administrator access.

By default, the system is installed with a single predefined user whose name and password are both set to **admin**. You should change the password after you log in for the first time. Administrator access rights allow you to modify system properties, and in particular to create and modify MediaLocations and Users.

MediaLocations

A MediaLocation is a local or network file storage location from which the system can access media files. Typically, this would be a directory on the hard drive or a video server that provides FTP or Windows file share access. To create a MediaLocation, a user must supply its URL and the username and password required to access this URL. In addition, you must supply a unique name to be used within the system to identify the MediaLocation.

Only users with administrator access are able to create or modify MediaLocations.

MediaSets

A MediaSet is a collection of media files that you want to check.

A MediaSet can be a DropBox. A DropBox is a directory that is continually monitored for new media files. A MediaSet that is not a DropBox is simply a static collection of media files manually selected from one or more of the MediaLocations.

If a Job is associated with a DropBox, every file that appears in the DropBox over time will be processed.

Templates

To check a media file, you must define which checks should be applied when the file is tested. A Template is a collection of such checks chosen to perform specific tests that you require. The four types of Templates are:

- Container Templates, which apply to the transport/container layer of a media file

- Video Templates, which apply to the digital video content of a media file

- Audio Templates, which apply to the digital audio content of a media file

- Action Templates, which specify actions to be performed as a result of processing a media file

You can create multiple Templates of the same type for different purposes. For example, you might create a "Movies" Template, which contains a set of rules appropriate for HD MPEG-2 content, and an "on-line content" Template, which contains a set of rules appropriate for lower resolution H.264/AVC content.

NOTE. *Some example templates are preloaded onto QCloud. These templates can be used, copied, edited, and archived in the same way as those created by users. The XML files containing these templates can be found in* `<Installation directory>/Example Templates`.

Profiles

A Profile gathers together a container, video, audio, and action Template, providing a complete set of checks that can be applied when you want to test one or more media files. Any of the component Templates can be omitted, depending on your requirements. For example, it makes no sense to apply any container or audio checks to a media file that consists solely of a video elementary stream.

Jobs

A Job is the term given to an individual testing process that can be run by the system. Each Job can process multiple media files or a single media file, depending on the requirements of the user. The set of files processed by a Job is defined by its MediaSet.

By creating a Job, you request the checks defined by a particular Profile be applied to the files in a particular MediaSet. In addition, you must specify the name and priority of the Job. The system can queue multiple Jobs to be run, whereby each Job is scheduled to be processed according to its priority.

The system processes one media file at a time.

How long it takes to process a Job depends upon a number of factors:

■ The resolution of the video being processed (the larger the picture, the slower the processing)

■ The video standard concerned (some standards, such as H.264/AVC, take more time to process)

■ The number of tests selected (performing all the video quality checks can be processor intensive, because it requires the analysis of every pixel in each frame of video)

■ The bit rate (in general, the higher the bit rate, the slower the processing)

■ Hardware performance of the computer on which QCloud is installed

Alerts

Alerts announce any checks that fail as a Job executes. Each alert indicates the severity of the failure, as well as where and why the check failed. The system gathers alerts associated with a particular Job, so that you can access the results from the top level and easily navigate to the details, such as which individual frames have Alerts.

The system organizes and summarizes any alerts raised against a particular Job, so that, at the top level, a single **processing result** status can be assigned to the Job. To view more detailed information, you can drill down through the interface, revealing (for example) which individual frames have raised alerts.

Reports

Reports provide you with a way to query the system database and obtain information in a predefined format. A Job report presents the results of a particular Job in tabular form.

Procedures

Overview

The following figure shows the dependencies between the entities that make up a Job. For example, a MediaLocation must exist to create a MediaSet and a MediaSet must exist to create a Job.

NOTE. A Profile requires at least one type of Template, not necessarily all four types.
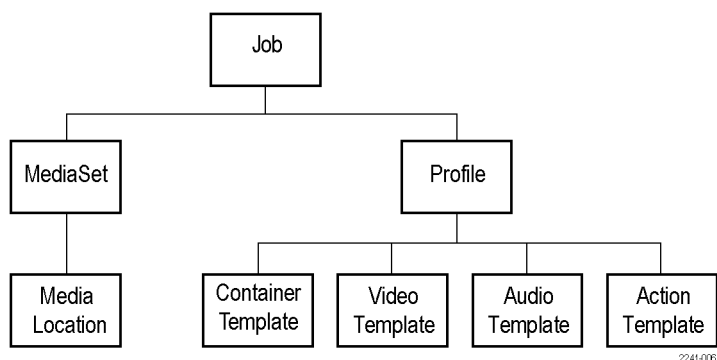
How to start the QCloud application

Perform the following procedure to start the QCloud application.

1. Click the **Launch QCloud** icon on the desktop to launch the QCloud application.

2. Enter your **Username** and the **Password** in the login page. The default Username and Password are admin.

3. Once you are logged in, you can see the Jobs Monitor page.

How to start a cluster

Perform the following steps to start a cluster.

1. Start QCloud on Supervisor unit first.

2. Start QCloud on Media Test Units.

3. Enter the `URLhttp://` `<QCloudhost name>` into your Web browser where QCloud host name is Supervisor's host name.

NOTE. By selecting the Media Test Units link on the Admin page, it is possible to view the status of the Media Test Units connected in a cluster. Since a standalone system does not connect to any Media Test Units, this link is unavailable in the Web UI of a standalone system. After clicking the link, you will be taken to the Media Test Units page which lists all the Media Test Units that are in the cluster.

How to create a MediaLocation

1. Click the **Admin** button on the Navigation Bar to access the Admin page, as shown in the following figure.

Figure 3: Creating a MediaLocation

2. Start creating a new MediaLocation by clicking the **Go** button next to the text that reads **Create new MediaLocation**. You should see a form.

3. Fill in the fields in the form as shown in the following table, and then click **Create** to create the MediaLocation.

Field	Value
MediaLocation Name	QCloud example content
URL	`D:\streams\DemoStreams`
Username	-
Password	-

Figure 4: New MediaLocation
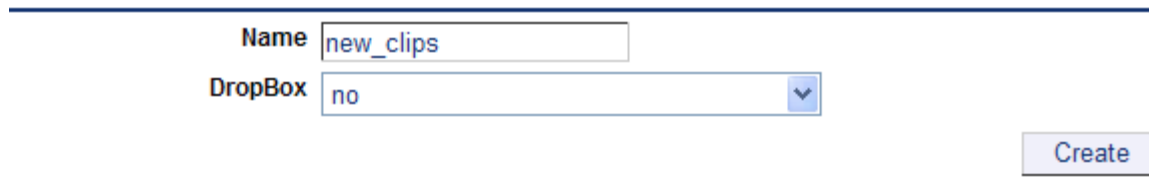
NOTE. The system validates the MediaLocation details when you click the Create button, checking that the MediaLocation name is unique, the URL exists, and that the specified user can access files at that URL. If any of these checks fail, the MediaLocation will not be created; instead, the form will be posted back to the screen with an error message indicating what the problem is.

How to create a MediaSet

Once you have created a MediaLocation, you can create a MediaSet that collects the files at this location.

1. Click the **MediaSets** button on the Navigation Bar to visit the MediaSets page.

2. Start creating a new MediaSet by clicking the **New MediaSet** button. You will see a page like the one shown in the following figure.

Figure 5: New mediaset

3. Select **no** for the DropBox mode.

4. Enter a suitable name for the MediaSet and click **Create** to create the MediaSet and continue to the Edit MediaSet, as shown in the following figure.
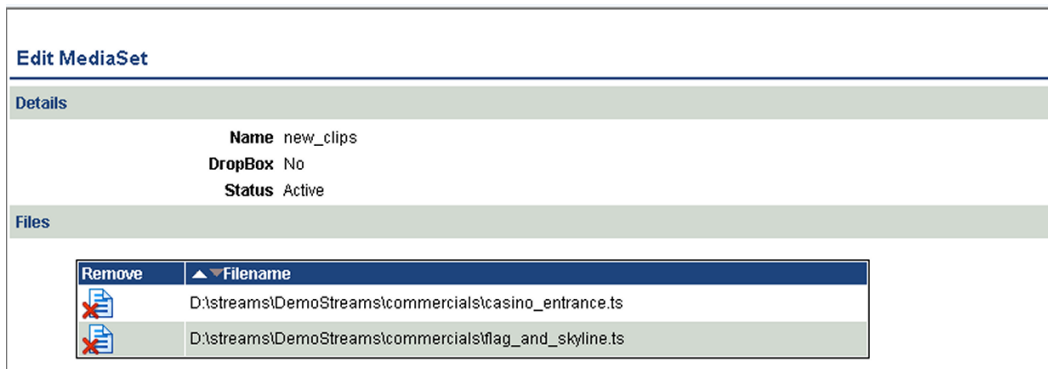
Figure 6: Edit MediaSet

The Edit MediaSet page provides details of the files already in the MediaSet (there should be none yet). It shows directories with a 📁 icon, and files with a 📄 icon. The page also provides the controls for you to add new files.

5. Add files to the MediaSet using the directory and file browser.

- To reveal the contents of a directory, double-click the directory.

- To close the directory and go up a level, open the drop-down menu control at the top right of the file browser to provide a selection of recent directories.

- To select a file, double-click the 📄 file icon (it will appear in the Files table).

The following figure shows a MediaSet to which three files have been added.

Figure 7: MediaSet containing files

6. You can also add a file to the MediaSet by entering the full path to the file in the **File name** text field at the bottom of the page.

   This path must include the full URL of the file. For example, `D:\streams\DemoStreams\airport_interview.ts`.

How to create a Template

To test the files in your new MediaSet, you need to decide which checks to apply. Checks can be applied to the container or wrapper layer, the video stream, and the audio stream, using container, video, and audio Templates, respectively.

In addition, using an Action Template, you can define actions to take when files have been checked.

1. Click the **Templates** button on the Navigation bar to start creating a Template. You will see a page listing the Templates that are present in your current Templates view.

Select video template type.   Select the video template type as follows.

1. Click the **New Video Template** button to create a new Video Template. You will be prompted to select a Template type, as shown in the following figure.

Figure 8: Select Template type

The Template type you choose depends on the type of video content you want to check. This type will be the Video Standard used when the video was encoded: for example, MPEG-2 or H.263.

2. Use the drop-down menu to select **MPEG-2**, and then click the **Select** button to take you to the New Video Template page. This is where you define which checks to include in your Video Template.

⚠ *CAUTION.* *The new Template will not be saved until you click the Create button at the bottom of the page. When you click* **Create**, *the system will check that the fields you have filled contain valid data, and prompt you to fix any problems. If there are no problems, the new Template will be created and stored in the database.*

3. Enter a name for the Template, "News Video", and optionally a description.

4. Configure the checks to be applied by selecting the check boxes and entering values into the text fields. (See the following figure for a typical Video Template configuration.) Use the Add / Remove buttons to configure the Resolution rule with multiple sets of valid values. For a full explanation of the checks performed by each rule, click on the ⓘ icon next to each rule name.

5. Click the **Create** button at the bottom of the page to create the new Video Template.

The following figure shows a typical MPEG-2 Video Template configuration. When this Template is used to check a video stream, it will check:

- The video is MPEG-2 encoded.

- The video is encoded using MPEG-2 Main Profile, Main Level.

- The video bit stream syntax conforms with the MPEG-2 Standard, but any alerts relating to Buffer analysis and alert number 22209 will be suppressed.

- A maximum of 500 alerts will be displayed.

- Each alert type will be displayed a maximum of 20 times.

- The video resolution is 720 by 480 pixels or 1280 by 1080 pixels.

Figure 9: Video template configuration

When this MPEG-2 Video Template is used to check a video stream, it will check the following:

- The video is MPEG-2 encoded.

- The video is encoded using MPEG-2 Main Profile, Main Level.

- The video bit stream syntax conforms with the MPEG-2 Standard, but any alerts relating to Buffer analysis and alert number 22209 are suppressed.

- A maximum of 500 alerts are displayed.

■ Each alert type is displayed a maximum of 20 times.

■ The video resolution is 720 by 480 pixels or 1280 by 1080 pixels.

You can also create an Audio Template and a Container Template similarly.

To create an Audio Template, select **New Audio Template** and select **MPEG-1 / MPEG-2 Audio** as the template type. For the Container Template, select **MPEG-2 Transport Stream** as the Template type.

NOTE. *In this example, you will not create an Action Template. If you want to check a different video format, you should select a different codec type.*

How to create a Profile

To use your new Video Template in a Job, you must include it in a Profile.

1. Click the **Profiles** button on the Navigation bar to go to the top-level Profiles page.

2. Click the **New Profile** button.

3. Enter a name and optionally a description for the Profile, as shown in the following figure.

4. Select the Container Template, Audio Template, and Video Template you just created. If you created more than one audio template, click the Plus icon to display another audio template selection field.

5. Click the **Create** button to create a Profile.

How to create a Job

Once you create a MediaSet and a Profile, you can create a Job.

1. Click the **Jobs** button on the Navigation Bar to go to the top-level Jobs page.

2. Click the **New Job** button.

3. Enter a name for the Job. Set the Job priority to "Low", and select the Profile and MediaSet that you previously created.

4. Click **Create** to create the Job.

New Job

Job Details

Job Name	new job
Priority	Low
Profile	News
MediaSet	new_clips

Create

Figure 10: Creating a job

How to inspect Job results

1. Access the Jobs Monitor page by clicking the **Jobs** button on the Navigation Bar. This page gives feedback on the status of all running Jobs (unless the Job view has been set to **Archived**). This feedback includes:

    – A processing result summary for each Job

    – Status and progress information for each Job

    – Summary information about the entities associated with each Job

    – Timing information for each Job

2. Click the **AutoRefresh** button in the page header to arrange for the page to refresh periodically with no further intervention. This is useful when you are monitoring the progress of a large Job that might take several minutes to complete.

3. Wait for the Job Status to show complete before continuing with this tutorial. This may take several minutes.

4. From the Jobs Monitor, you can drill down for more details about a Job result.

How to generate a Report

1. Access the Reports page by clicking the **Reports** button on the Navigation Bar. This page allows you to generate Job processing reports.

2. In the **Enter Jobname** field, enter the name of the job that you created.

3. Select the report format. You can select either HTML or PDF (Summary or Complete) report format.

4. Click the **Generate** button to generate a report on your Job.

How to archive the Job

1. Click **Jobs** on the Navigator bar.

2. In the Job Monitor page, select the Job you want to archive by selecting the check box in the left column of the Jobs Monitor table.

3. Ensure that the action drop-down menu under the table shows Archive.

4. Click **Go** to archive the Job.

5. To view archived Jobs, set **Show Jobs** to Archived.