# Akamai® HD Network

## Akamai HD for iPhone® and iPad®— On Demand User Guide

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# Akamai HD for iPhone® and iPad®—On Demand User Guide


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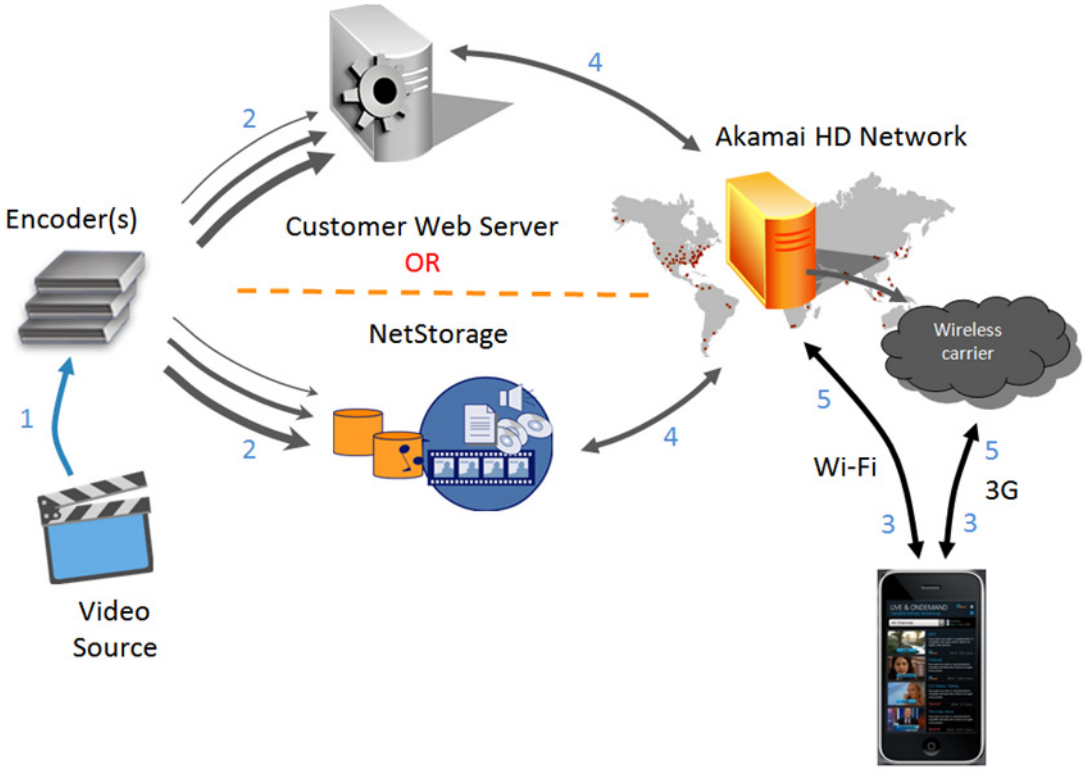
Welcome to the *Akamai® HD for iPhone® and iPad® User Guide*. The Akamai HD Network simplifies getting your content into the Apple® HTTP Streaming specification by performing packaging and segmentation in-network. So you can stream on-demand media from an ordinary Web server via HTTP to Apple iPhone or iPad mobile digital devices running version 3.0 or higher of their operating system and to other devices that use Apple QuickTime® X, all without the inherent limitations of progressive downloads.

## Architecture Overview

Compared to other streaming formats, the architecture for Akamai HD for iPhone is relatively simple.




1. Media is encoded in H.264/HE-AAC format.
2. The content is uploaded to the content origin, either Akamai NetStorage or your own Web server.
3. The end user's client (iPhone or QuickTime X) requests the content from the Akamai HD Network.
4. Akamai HD Network retrieves your content from the origin, dynamically generates the M3U8 files, and segments the video for end-user consumption. It then

returns the playlist (M3U8) files or the media segment as requested by the player on the device.

5. The chosen media segment and subsequent segments are sent to the end user's client for viewing and/or listening.

*Note: For your iPhone streaming traffic, always use a CP code, hostname, and configuration separate from your other Akamai services.*

# Provisioning Akamai HD for iPhone and iPad

Akamai HD for iPhone and iPad setup begins with the initial activation of your account by Akamai. When completed, you will access your Akamai HD account using the Akamai EdgeControl® portal, using it to set all necessary parameters to serve your on-demand media stream.

## Accessing Your Akamai HD Account

Access your Akamai HD account as follows:

1. Log in to the EdgeControl portal.
   a. Start your Web browser and open **https://control.akamai.com**.

      The **Akamai EdgeControl Login** page appears.

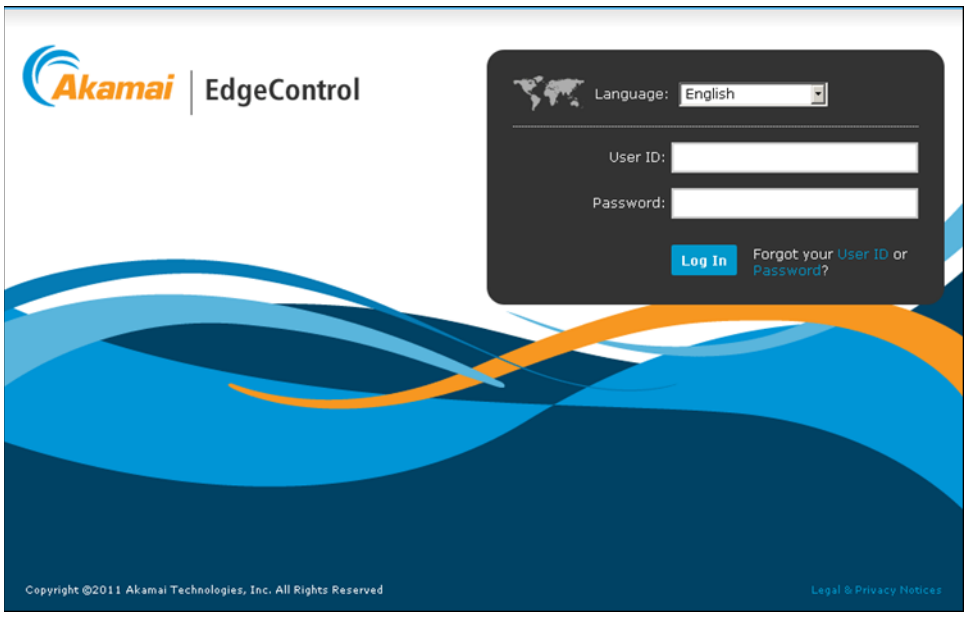



Figure 1-1. The Akamai EdgeControl Login Page

   b. Enter your username and password, and click Log In.

      The EdgeControl **Welcome** page appears.

## Creating an Akamai HD Hostname

The first step in provisioning Akamai HD for iPhone and iPad is to create an Akamai HD hostname to which you point your own hostname via DNS CNAME. For example, your hostname **www.example.com** might point to an Akamai HD hostname you created called **www.example.com.akamaihd.net**. The Akamai HD hostname, in turn, resolves to the optimal Akamai Edge server.

1. Navigate to the **Akamai HD Hostnames** page.
    a. On the EdgeControl portal's welcome page, in the left-hand navigation menu, click HD On Demand Streaming.

    The **HD for iPhone/iPad Traffic** page appears (or the **HD for Silverlight Traffic** or **HD for Flash Traffice** page depending on how many Akamai HD services you are using).

    b. In the left-hand navigation menu under HD On Demand Streaming, click Tools.

    The **Tools** page appears.

    c. Under the **Configuration Tools** header, click Edge Hostnames.

    The **Edge Hostnames** page appears.

    d. Click Akamai HD.

    The **Akamai HD Hostnames** page appears.

    e. To the right of the **Search Criteria** header, click Create Akamai HD Hostname.

The **Create Akamai HD Hostname** page appears.

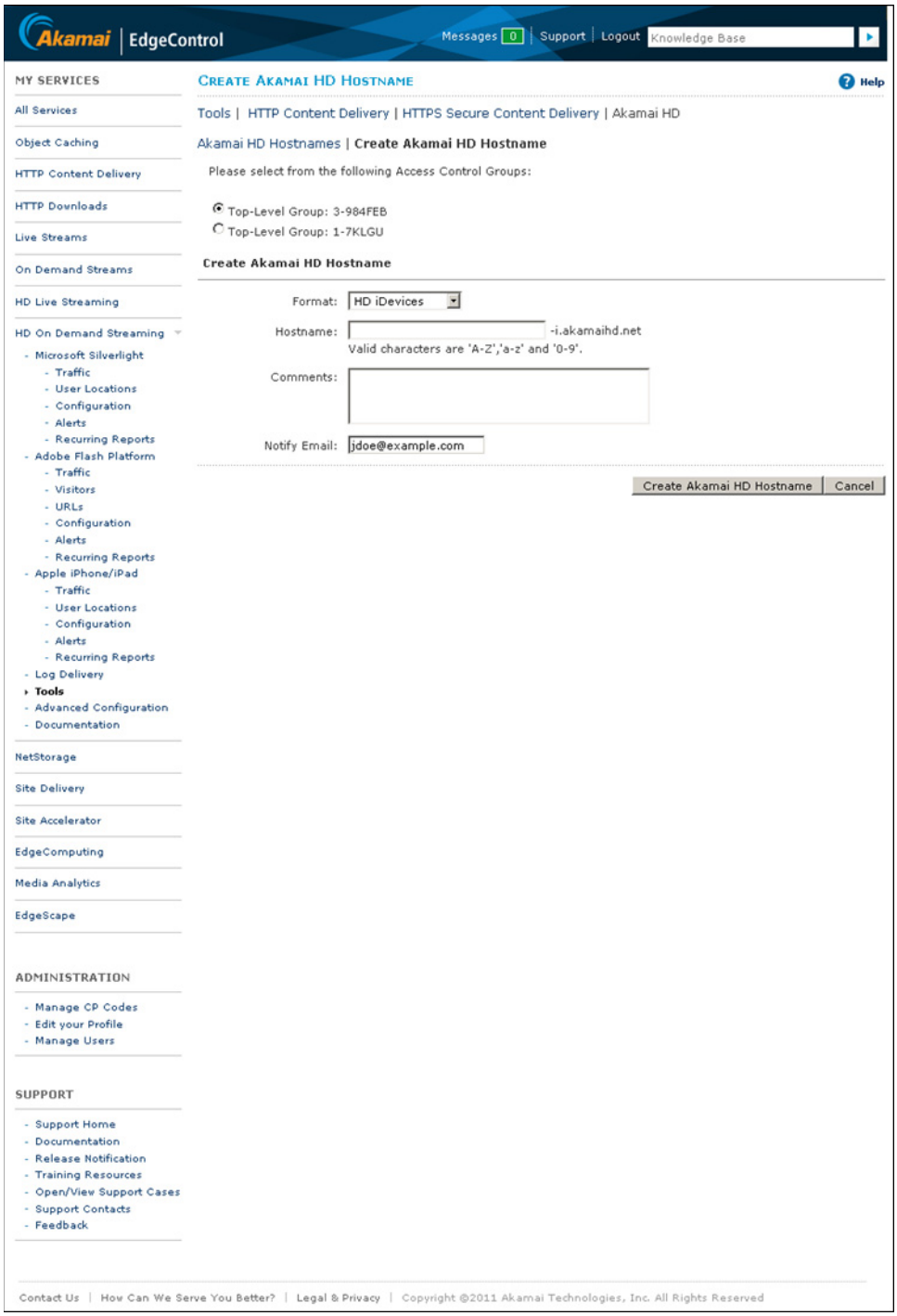



Figure 1-2. Create Akamai HD Hostname Page

2. Create an Akamai HD hostname.
    a. From the **Format** dropdown menu, select **HD iDevices**.
    b. In the **Hostname** text box, enter a unique hostname to act as a prefix for the **-i.akamaihd.net** domain (e.g., **example-i.akamaihd.net**).

This is typically a domain that you own already since there it will ensure duplication with another Akamai customer will not occur.

*Note: Hostnames cannot exceed 14 characters (alphanumeric and underscore only). The "**-i**" suffix indicates it is associated with Akamai HD for the Adobe Flash Platform (e.g., **example-i.akamaihd.net**).*

c. In the **Comments** text box, enter any desired comments (optional).

d. In the **Notify Email** text box, enter an e-mail address to which notifications regarding the hostname will be sent.

e. Click Create Akamai HD Hostname.

A dialog box with a confirmation message regarding the hostname appears.

f. Click OK.

The **Create Edge Hostname** page appears displaying the hostname, its ID, and its details.

## Creating Akamai HD for iPhone and iPad Configurations

Before you can create new streams, you must create at least one configuration file for your digital property, which is the full, end-user-facing hostname, such as www.example.com or movies.example.com (a single configuration file may include multiple digital properties). These configuration files are implemented as XML-type files containing XML tags that are interpreted as instructions by the Akamai HD network.

Creation of configuration files is performed using the EdgeControl portal's Configuration Manager, which provides a plain-language interface with which you specify the configuration parameters. Configuration Manager then creates the appropriate XML file. The following sections will walk you through the process of creating configuration files. For further information regarding use of the Configuration Manager, please refer to the Akamai Configuration Manager User Guide, available on the EdgeControl portal.

### Creating a Configuration File

1. Navigate to the **HD iPhone/iPad On Demand Streaming Configurations** page.

   a. In the EdgeControl portal's left-hand navigation menu, click HD On Demand Streaming >> Apple iPhone/iPad >> Configuration.

   The **HD iPhone/iPad On Demand Streaming Configurations** page appears.

2. Access the EdgeControl portal's Configuration Manager.

   a. On the **HD iPhone/iPad On Demand Streaming Configurations** page, click Create a New Configuration.

   The **Welcome** page appears.

b. Read the information on the **Welcome** page and click Next.

The **Configuration Attributes and Digital Properties** page appears.

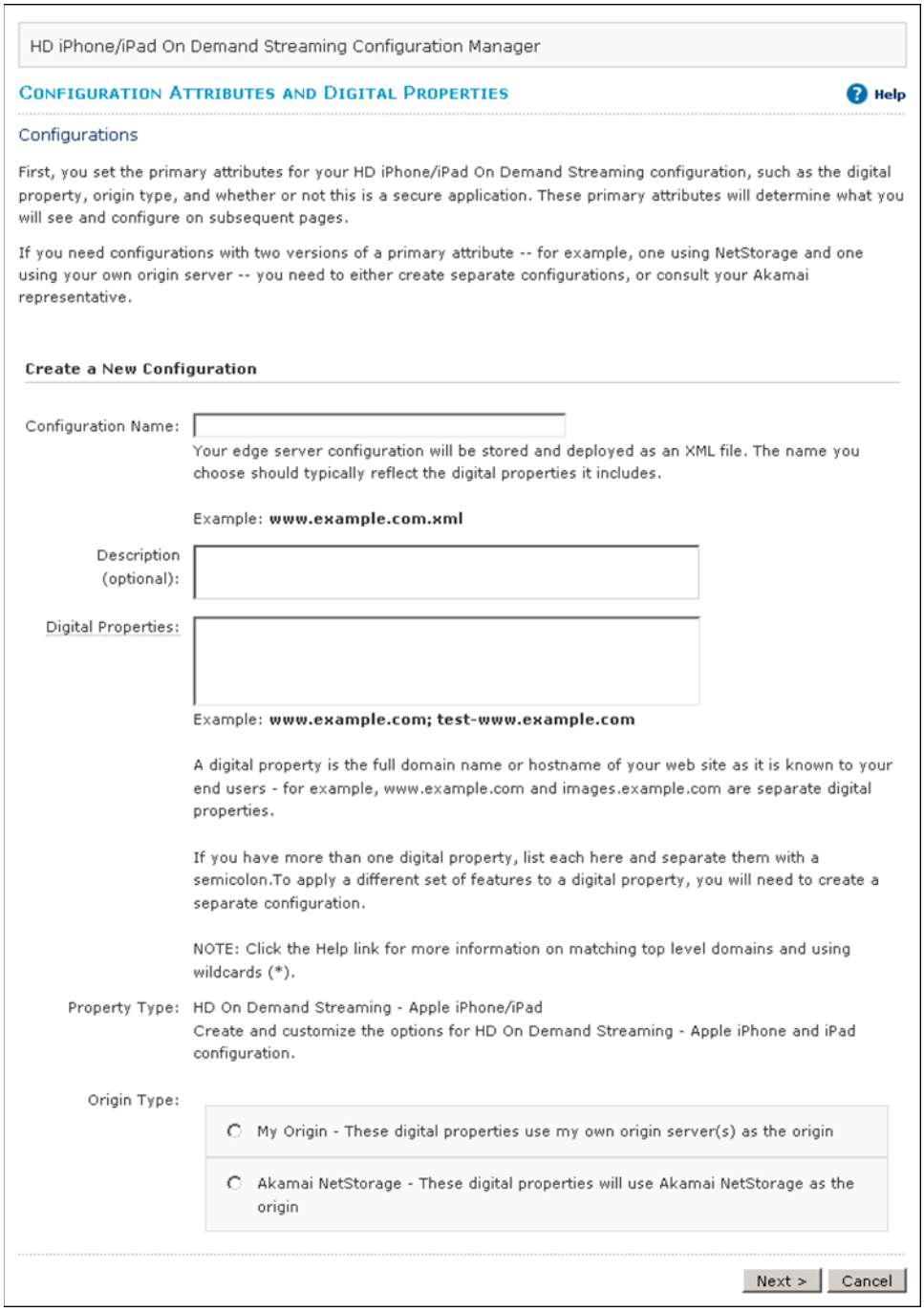



Figure 1-3. The Configuration Attributes and Digital Properties Page

3. Define the configuration's attributes and digital properties.

   a. In the **Configuration Name** text box, enter a name for the configuration file.

      The configuration file is stored as an XML file, and the name you choose should typically reflect the digital properties it includes (e.g., hdiphone.example.com.xml).

   b. In the **Description** text box enter a description of the configuration, if desired.

   c. In the **Digital Properties** text box, enter all of the domain names or hostnames you wish the configuration to encompass (e.g., hdiphone.example.com).

      Separate multiple properties with a semicolon.

*Note: .You must include the Akamai HD hostname you created earlier (see "Creating an Akamai HD Hostname" on page 3).*

   d. In the **Origin Type** area, select either **My Origin** or **Akamai NetStorage**, depending on what you will use as an origin for your on-demand content.

*Note: If you are using your own Web server as origin, ensure it is HTTP 1.1-compliant.*

   e. Click

.

      The **HD iPhone/iPad On Demand Streaming Technical Notes and Warnings** page appears.

   f. Read the information on the page and click

.

The **CP Code and Origin Configuration** page appears.

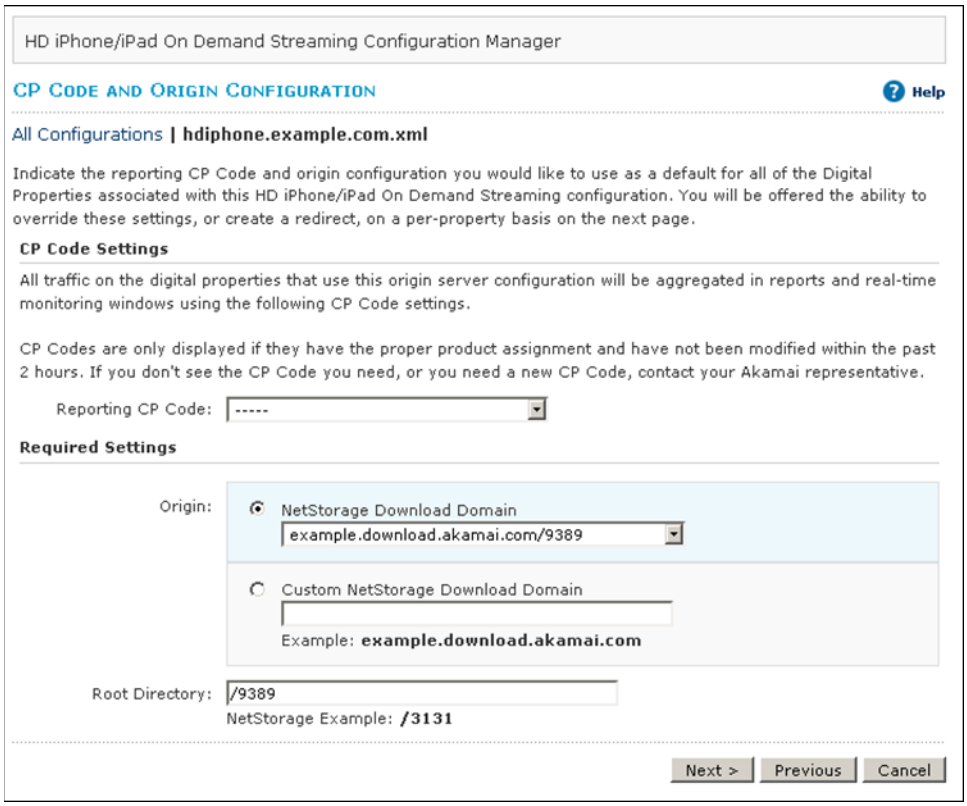



Figure 1-4. The CP Code and Origin Configuration Page

4. Add the configuration parameters.

    a. In the **CP Code Settings** area, from the **Reporting CP Code** dropdown menu, select the CP code you would like to associate with the configuration.

    b. In the **Required Settings** area, configure your origin server.

    - If using your own Origin:

        aa. In the **Origin Server Hostname** text box, enter the domain of your origin server (e.g., origin.example.com).

        bb. In the **Origin Server's Expected Hostname** (**Forward HOST header**) area, select the radio button of the option for the hostname you would like the Akamai server to send to your origin in the HTTP HOST request header.

        - **Digital Property.** Use the digital property name received in the request.
        - **Origin Server.** Use the origin server hostname.
        - **Fixed String.** Use a custom value.

          If you select this option, enter the string in the **Indicate the string below** text box.

- If using Akamai NetStorage:

  aa. From the **Origin** area select either the **NetStorage Download Domain** radio button or the **Custom NetStorage Download Domain** radio button as appropriate.

  - **NetStorage Download Domain.** Select the domain to use from the accompanying dropdown menu.
  - **Customer NetStorage Download Domain.** Enter the domain name in the accompanying text box.

  bb. In the **Root Directory** text box, enter the root directory for your streaming content.

c. Click Next >.

The **Enable iPhone Muxing** page appears.

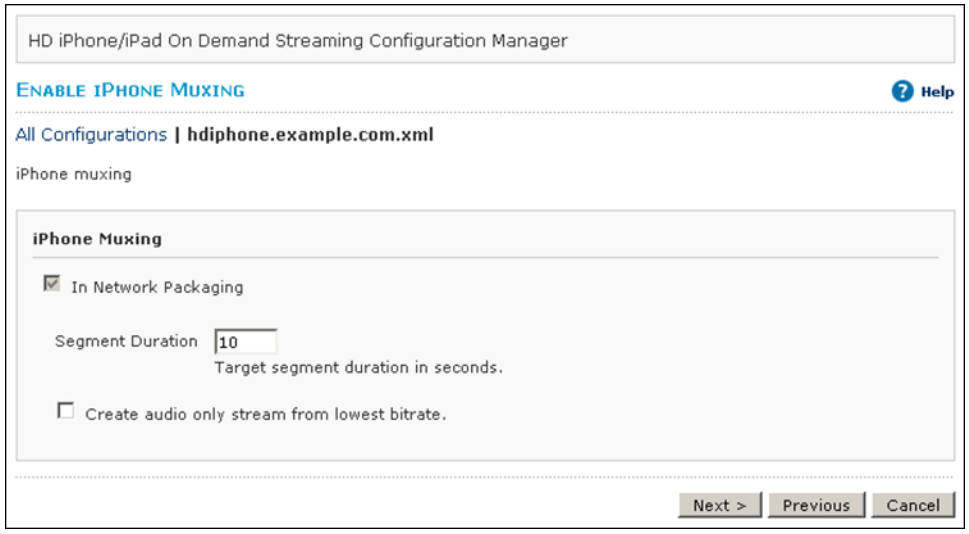



Figure 1-5. The Enable iPhone Muxing Page

d. In the iPhone Muxing area, in the Segment Duration text box, enter the target media segment duration (in seconds).

It is highly recommended you use Apple's recommended 10-second duration.

e. If you wish to create an audio-only stream for your event by extracting it from your lowest bitrate stream, select the **Create audio only stream from lowest bitrate** check box.

Selecting the check box causes an **Insert Audio Poster** check box to appear. If you wish to upload an image file for the extracted stream select this check box and enter the HTTP path to your image in the resulting **Image Path** text box.

*Note: The maximum image size is 40 kb.*

f. Click Next >.

The **Review Changes** page appears (see Figure 1-6 on the next page). Here you can review and edit configuration.

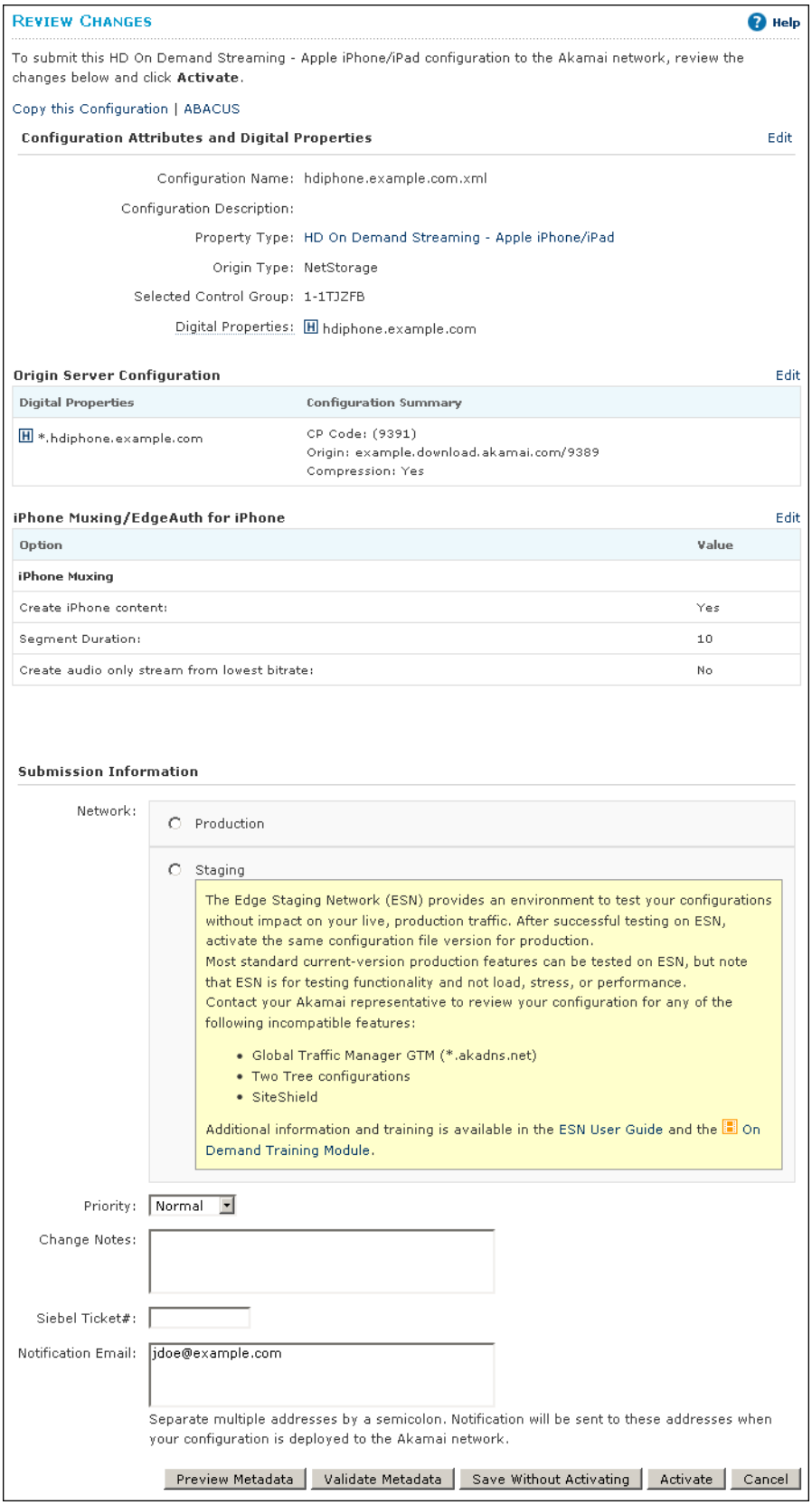



Figure 1-6. The Review Changes Page

5. Complete the configuration creation process.

    a. On the **Review Changes** page, check the parameters in the **Configuration Attributes and Digital Properties**, **Origin Server Configuration**, and **iPhone Muxing/EdgeAuth for iPhone** areas for accuracy.

    b. In the **Submission Information** area:

        i. Select whether you would like to activate the configuration on **Staging** for testing or on **Production** to go live.

        ii. In the **Change Notes** text box, enter any notes you desire (required).

        iii. In the **Notification Email** text box, enter one or more semicolon-delimited e-mail addresses if you wish to receive an e-mail notification when the configuration is deployed.

        iv. Click the appropriate button at page bottom:

        - **Preview Metadata**—View the configuration metadata you just created.
        - **Validate Metadata**—Check to ensure the metadata is without errors.
        - **Save Without Activating**—Save the configuration, but do not activate it on the network.
        - **Activate**—Save the configuration, and activate it on the network.

        If you select **Activate**, the metadata will be validated, and if any potential problems are found the **Review Request** page will display a second time with a summary of the issues found.

        At this point you can make changes to your configuration and attempt to activate it again, or you can scroll to the bottom of the page and click **Activate** again to accept the configuration as-is.

        Once activated, the **Changes Submitted** page appears with information regarding the activation of your configuration.

        v. Click **Return to Configurations** to return to the **HD iPhone/iPad On Demand Streaming Configurations** page.

        Your configuration file will be live on your the network you selected in approximately 40 minutes.

## Encoding Your Content

End users accessing content on an iPhone, iPad, or iPod touch® will experience widely varying download speeds depending on whether they are accessing the content over Edge, 3G, or WiFi. For maximum compatibility across different generations of hardware and software, Akamai strongly recommends encoding your content per Apple's

guidelines available at **http://developer.apple.com/library/ios/#technotes/tn2010/tn2224.html**.

Apple also makes a Web page available at **http://developer.apple.com/resources/http-streaming/** that has links to their HTTP Streaming documentation, including the latest best practice recommendations for encoding, deployment, app development, and app submission.

The following audio and video formats are supported:

**Video:**

- iPhone and iPod touch—H.264 Baseline Profile Level 3.0
- iPhone and iPad—Main Profile Level 3.1

**Audio:**

- HE-AAC or AAC-LC up to 48 kHz, stereo audio

*Note: Be aware that there will be one MP4 file per bitrate.*

**Input Containers:**

- F4V
- F4F
- F4M
- MP4
- FLV

*Note: FLV will only work if onMetdata is present with the following name value pairs: width, height, video datarate, audio datarate, and duration.*

In addition, there are other encoding best practices that you will want to adhere to, including:

- H.264 encoding should be single-pass Baseline Profile with frame reordering disabled. Key frames are suggested every three (3) to five (5) seconds.
- Encode your event for the widest audience you are concerned with.
- Use the same audio encoding in all variant streams to avoid glitches during switches.
- If you desire to have an audio-only stream for your event, it must be 64kbps or lower and must be encoded in accordance with Apple's guidelines.
- For maximum compatibility with older generations of iOS software and hardware, MP4 files must not have b frames.

Following are links to Web pages containing the video playback specifications for a variety of Apple devices, which relate the types of encoding each device supports.

| | |
|---|---|
| **iPhone** | **3G**—http://support.apple.com/kb/SP495<br>**3GS**—http://support.apple.com/kb/SP565<br>**4G**—http://www.apple.com/iphone/specs.html |
| **iPod touch** | **2nd generation**—http://support.apple.com/kb/sp496<br>**3rd generation**—http://support.apple.com/kb/SP570<br>**4th generation**—http://support.apple.com/kb/SP594 |
| **iPad** | http://www.apple.com/ipad/specs/ |

# Storing Your Content

Your Akamai HD for iPhone content is delivered over HTTP, so you can serve it from Akamai NetStorage or from nearly any origin Web server, including Apache or IIS. You can use a variety of methods suitable to your operating system to move the content.

## Using Akamai NetStorage

This section outlines the best practices for ingesting content to NetStorage. You can upload your content to NetStorage in several ways: HTTP POST/DELETE, File Transfer Protocol (FTP), rsync, Secure Copy (SCP), and SSH File Transfer Protocol (SFTP).

For on-demand content, customers typically choose FTP for transferring files to NetStorage.

## Using Your Origin Web Server

If you opt to use your own Web server you must disable the "last access timestamp update" on the origin server if you have not already.

### Origin Server Requirements

If you host your videos on your own server, you must have adequate resources provisioned so that Akamai's servers can retrieve the videos. Following are requirements for origin servers:

- Servers must be HTTP 1.1 compliant to support byte-range GET requests.
- Servers must return a Last-Modified header on every byte-range GET request; the header must be identical for all chunks of a given file and must not change unless the file is replaced.

*Note: If your origin consists of multiple servers behind a load balancer, or if the origin host name returns multiple server IP addresses, you must ensure that, for a given file, the Last-Modified header is identical on each server and IP address.*

- Servers must return an updated Last-Modified header when a file is replaced.

You must also purge the file from Akamai Edge servers using the EdgeControl portal's HD Content Control Utility to ensure they fetch the new version (see "Changing Your Content" on page 18).

- Servers must have adequate processing power and provisioned bandwidth to handle the maximum expected simultaneous requests from Akamai's servers (note that this will never exceed, and is usually substantially less than, the maximum number of requests received when not using Akamai Streaming).

# Serving Your Content

Any Apple device that supports HLS (HTTP Live Streaming) will directly support a segmented streaming approach and launches when a user enters an M3U8/M3U link into the Apple Safari® browser. Publishers may also choose to write their own native iPhone apps that are able to seamlessly browse content, leveraging the Media Player for content rendering.

## Using the Client-Side URL Syntax

If you are unable to generate or provide server-side SMIL files, you can alternatively use a client-side URL format with which you can encode the entire SMIL contents in a single URL. For Akamai HD for iPhone and iPad, the client-side URL takes the form:

**http://<*customer*>-i.akamaihd.net/i/<*subdirectory*>/<*common_filename_prefix*>,<*bitrate*>,<*bitrate*>,<*bitrate*>,<*bitrate*>,<*common_filename_suffix*>.csmil/master.m3u8**

So a published URL to the device for this form of integration might look like:

**http://example-i.akamaihd.net/i/movies/example2a_,300000,500000,800000,1000000,_event1.mp4.csmil/master.m3u8**

Using the above examples and assuming a CP code of 9389, your content would reside on Akamai NetStorage at **example.download.akamai.com/9389/movies/** as:

- **example2a_300000_event1.mp4**
- **example2a_500000_event1.mp4**
- **example2a_800000_event1.mp4**
- **example2a_1000000_event1.mp4**

*Note: If you plan to stream just a single bitrate file, it does not need client-side URL and could be added by itself (i.e., a single mp4 file called hello.mp4 could have a syntax of **<hostname>/i/hello.mp4/master.m3u8**).*

## Using Query Strings

Three query strings are available for use with the client-side URL:

*Note: The values below are in kbps and are applied to the combined audio + video bitrate.*

- **__a__**. When enabled in an Akamai HD for iPhone and iPad configuration, the Akamai Edge server automatically generates an audio-only stream from one of your bitrate streams. You may use the __a__ query string to disable this feature on a per-stream basis, if desired (e.g., **<*uri*>/master.m3u8?__a__=off**).
- **__b__**. If desired, you can designate a specific bitrate stream to be the "preferred" bitrate, meaning the end-user's player would start with this bitrate before adjusting to another bitrate depending on network conditions (e.g., **<*uri*>/master.m3u8?__b__=500**).
- **b**. If you would like to filter out certain bitrates—to test a particular bitrate version, for example—you can do so by adding a **b** query string to the end of the publish URL. There are four uses:
  - Filter all bitrates except those specifically designated (and the lowest audio rate); the string takes the form:

    **b=<bitrate>,<bitrate>,<bitrate>,...**

    So, for example, if you had bitrates 200, 300, 700, and 1200, and you wanted to include only bitrates 200, 700, and the lowest audio rate, your URL would appear as:

    **<*uri*>/master.m3u8?b=200,700**

    This would produce only the 200 and 700 bitrate streams, as well as the lowest audio bitrate.
  - Designate a bitrate range (in kbps) outside of which the stream or streams you wish to filter fall; the string takes the form:

    **b=<lower_end>-<upper_end>**

    So, for example, if you had bitrates 200, 300, 700, and 1200, and you wanted to include all bitrates at or greater than 200 and at or less than 700, your URL would appear as:

    **<*uri*>/master.m3u8?b=200-700**

    This would produce the 200, 300, and 700 bitrate streams.
  - Designate the low end of a bitrate range (in kbps) where all bitrates below the value are filtered; the string takes the form:

    **b=<low_end>-**

So, for example, if you had bitrates 200, 300, 700, and 1200, and you wanted to include all bitrates at and higher than 300 kbps, your URL would appear as:

**<*uri*>/master.m3u8?b=300-**

This would produce the 300, 700, and 1200 bitrate streams.

- Designate the high end of a bitrate range (in kbps) where all bitrates at and above the designation are filtered; the string takes the form:

  **b=0-<high_end>**

  So, for example, if you had bitrates 200, 300, 700, and 1200, and you wanted to include all bitrates lower than or equal to 700 kbps, your URL would appear as:

  **<*uri*>/master.m3u8?b=0-700**

  This would produce the 200, 300, and 700 bitrate streams.

## Using SMIL Files

This is the usual form for passing your streams' information to the end-user client. For Akamai HD for iPhone and iPad, the SMIL publish URL takes the form:

**http://<*customer*>-i.akamaihd.net/i/<*smil_file_name*>.smil/master.m3u8**

So an actual SMIL URL might be something along the lines of:

**http://example-i.akamaihd.net/i/example2a.smil/master.m3u8**

Following is an example of the format for the contents of SMIL file example2a.smil:

```
<?xml version="1.0"?>
<!DOCTYPE smil PUBLIC "-//W3C//DTD SMIL 2.0//EN" "http://www.w3.org/
      2001/SMIL20/SMIL20.dtd">
<smil xmlns="http://www.w3.org/2001/SMIL20/Language">
  <head> <meta name="title" content="Event" />
      <meta name="httpBase" content="http://example.akamaihd.net/" />
  </head>
  <body>
      <switch id="whatever">
          <video src="subdir/example2a_300000.mp4" system-
            bitrate="300000"/>
          <video src="subdir/example2a_500000.mp4" system-
            bitrate="500000"/>
          <video src="subdir/example2a_800000.mp4" system-
            bitrate="800000"/>
          <video src="subdir/example2a_1000000.mp4" system-
            bitrate="1000000"/>
      </switch>
  </body>
</smil>
```

# Testing Your Content

You should test your content prior to making it available to your end users to help ensure they will have a problem-free experience.

1. Compose your URLs, and request the .m3u8 and segment files directly from a Web browser to check if they are cached and of the correct duration.

   This will confirm whether the connection delivery is correct. Be aware, you will not see video playback during this test.

2. Using the iPhone emulator, iPhone, iPad, or iPod touch® with the latest iOS version, request the file to watch it and ensure it plays correctly.

# Changing Your Content

There may be situations in which you will want to replace Akamai HD for iPhone and iPad content with other content while using the same file name. Doing this on your origin location is simply a matter of uploading the new content to take the place of the old. Akamai HD Edge servers, however, may retain the old content in their caches, requiring you to purge those caches to allow end users to play the new content.

*Note: Because of the nature of the multiple bitrate feature, you must purge every version of the content in question. Failure to do so can result in unpredictable behavior.*

Because in-place cache purging can be time intensive (approximately 90 minutes), Akamai recommends uploading your new content and then using a new publish URL. If you do decide to use in-place content purge, the next section describes the procedures.

## Purging Content

To illustrate the procedures below, the following assumptions are used as an example.

- The manifest URL:
  - **http://example-f.akamaihd.net/i/examplehost/event1.smil/master.m3u8**
- And these files residing on the origin:
  - **event1_220K_video.mp4**
  - **event1_500K_video.mp4**
  - **event1.smil**

*Note: Be certain you use the Akamai hostname and not your own CNAME'd hostname in the purge URL.*

1. Replace the content in question on your origin.

   If you are using Akamai NetStorage for your origin, refer to the *Akamai NetStorage User Guide* for information regarding accessing your account.

2. Use the EdgeControl portal's HD Content Control Utility to purge your iPhone and iPad media.

   a. Log in to the EdgeControl portal.

   b. In the left-hand navigation menu, click HD On Demand Streaming.

      The **HD for Silverlight Traffic**, **HD for Flash Traffic**, or **HD for iPhone/iPad Traffic** page appears, depending on what services you have.

   c. In the left-hand navigation menu under HD On Demand Streaming, click Content Control Utility.

      The **HD Content Control Utility** appears.

   d. From the **Content Type** dropdown menu, select **HD Apple iPhone/iPad On Demand**.

   e. If desired, enter a name for the request in the **Request Name (Optional)** text box.

   f. In the **Content to Refresh** area, in the first text box, enter the manifest URL from which content is to be purged (e.g., **http://example-f.akamaihd.net/i/examplehost/event1.smil/master.m3u8**).

      In the Content to Refresh area, in the second text box, enter the file names to be purged (e.g., **event1_220K_video.mp4**, **event1_500K_video.mp4**, **event1.smil**), separating each with a newline.

   g. In the **Notification** area, select whether or not you would like to receive an e-mail notification when the content purge is complete.

      If you choose to receive notification, enter your e-mail address in the accompanying text box.

   h. Click

.

      The purge is initiated. An e-mail will be forthcoming if you opted to for e-mail notification to signal the completion of the process.

*Note: Be aware that cache purges can take approximately 90 minutes to take effect.*

## Adding Security to Your Content

This section provides an overview of the security modules available for Akamai HD for iPhone and iPad. Contact your Akamai representative for their availability.

## Secure Media

Secure Media is designed to help prevent stream ripping attacks. This mechanism enables Edge servers to deliver encrypted content all the way to player run-time. Access to the "Encryption Key" can optionally be secured using Token Authorization and can be delivered over SSL to the player, when supported by the client environment. Encryption uses AES-128 bit crypto algorithm per Apple's specification.

## Token Authorization

Token Authorization prevents streams from link sharing and/or player highjacking attacks by ensuring the stream is only delivered to an authorized end user. This module is based on cookie tokens generated using trusted shared secret between Akamai and the content owner. Two cookie tokens are used: the first is short-lived and is used to secure playlist; the second is long-lived and valid for the duration of the content's play time to protect individual segments.

## Content Targeting

Content Targeting protects against content access in specific geographic areas that are prohibited by legal regulations, licensing restrictions, or other business rules. This service is available at two levels:

- Standard Level—Provides geographic-based protection based on continent, country, or region within and individual country.
- Pro Level—Offers additional granularity, providing access control based on city, margeting area, metropolitan statistical area (MSA), primary metropolitan statistical area (PMSA), and zip code (US and Canada only).