Chameleon for Digital Signage
C4DS
User's Guide

Revisions

Revision	Date	Details
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1.1	January 16, 2015	Initial Release.
1.2	March 25, 2015	Updated screen caps. Updated instructions for enabling digital audio out.
1.3	April 1, 2015	Added new weather forecast screen cap URL with user instructions.
1.4	April 8, 2015	Updated instructions for use of audio and composite video coax connections.
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1 Introduction

1.1 C4DS Overview

Chameleon for Digital Signage or C4DS is a Digital Signage (DS) system consisting of a network of xrs 4500 DS players managed by a cloud-based dashboard. C4DS is a very simple, easily configured signage solution capable of managing networks ranging in size from just a few DS players to thousands of DS players distributed globally. C4DS comes pre-installed on a variety of Android platforms including tablets and set-top boxes. Users simply plug in boxes or tablets, give them an internet connection and then manage them through the dashboard. Management tasks include tracking device connectivity and health, updating advertising campaigns or other graphical content, and viewing campaign playback statistics.

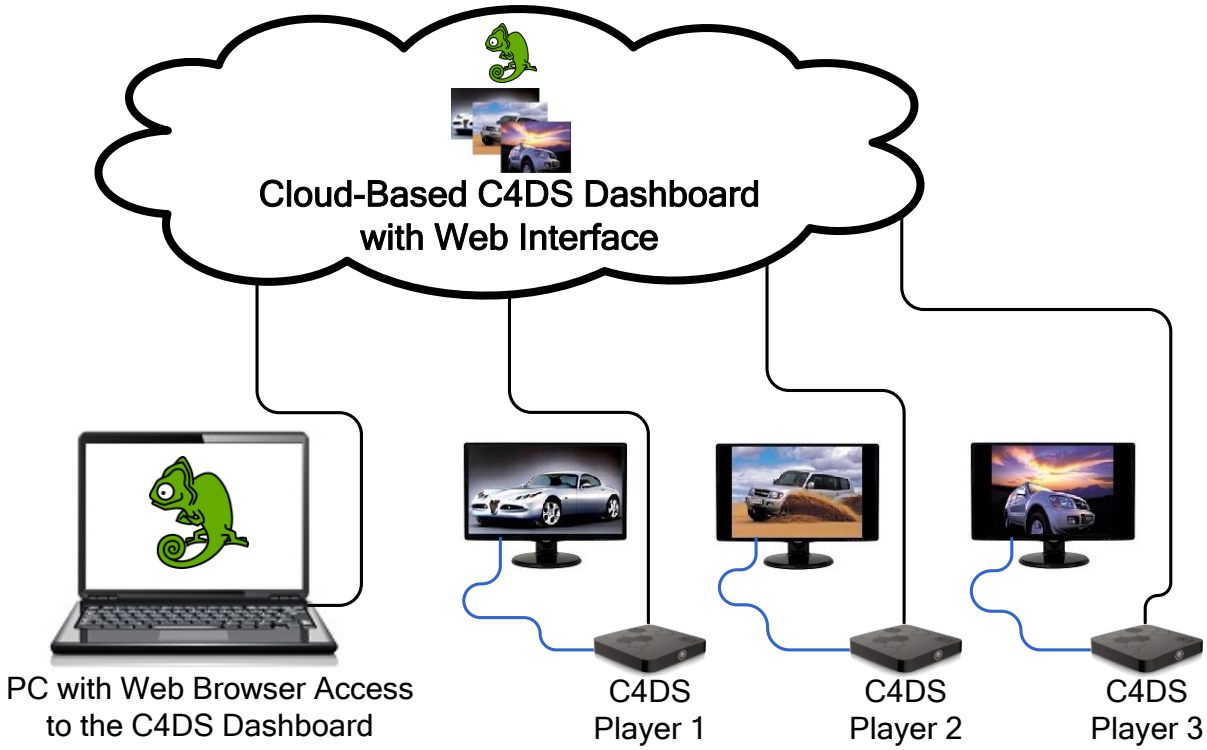


Figure 1 - C4DS Player Connectivity and Management

C4DS Features Include:

- Connectivity to any screen with an HDMI interface.
- Up to 4K or UHD (3840 x 2160) graphics.
- 1080p video playback.
- Automated Static Website capture and playback
- Internet radio playback with selection from over 20,000 Shoutcast stations.
- Remote device monitoring.
- Simple campaigns that continuously play a collection of uploaded ads files.
- Scheduled campaigns.

- Proof of Play reporting with data export.

1.2 Available Help Resources

This user's guide is the most comprehensive printed resource describing how to use a C4DS player and the C4DS dashboard. Additional printed resources are available as well as help in other media formats. Resources providing help include:

- Deviceworx YouTube Channel. Video Tutorials showing setup and use of the C4DS Products. See: https://www.youtube.com/channel/UCSo2YF-X9_gYUwhr68OV7xA/feed
- Deviceworx Support email. Any technical questions regarding Deviceworx products may be forwarded to support@deviceworx.com for a fast response.
- Deviceworx Sales Department. For assistance with the purchase of additional players, licensed features, or custom requirements, email sales@deviceworx.com for a fast response.

1.3 Setup Steps in Typical Order of Execution

Most users will follow the steps below in the order listed to get their C4DS player installed and displaying content.

1. Contact Deviceworx to purchase C4DS player platforms and provide Deviceworx with information that can be used to setup a customer account. Deviceworx customer support will then provide dashboard login credentials for the new account. Any players purchased will be automatically provisioned within this customer account.
2. Receive and install players. If Ethernet is used to connect a player platform to the internet, plug-in of Ethernet, HDMI (to a monitor) and power is all that is required. If Wi-Fi is used to connect to the internet, HDMI and power connections are made and then a connection to a local Wi-Fi Access Point is made.
3. Confirm player device communication within the dashboard device list (connected players are shown in green).
4. Enter device configuration details within the dashboard including setting its local time zone.
5. Upload ads or other content and create a collection for playback (termed a "campaign").
6. Optionally – schedule multiple campaigns to run at specified times.
7. Optionally – select an internet radio station for playback during each campaign.
8. Select a campaign for play within each player device.
9. Optionally – define different geographic locations or locales to describe player groupings within a network of player devices. These locales are used to more effectively list and organize player devices and support playback report filtering and breakdown. Example locales are divisions such as states or provinces, sites which may be physical locations and departments which are defined areas within sites.
10. Optionally – define additional users for account access.
11. View playback reports.
12. Optionally - Export playback reports to Excel or Adobe PDF files.

1.4 This Document

Sections included within this document describe user setup and configuration steps in the same order as those listed within 1.3 - Setup Steps in Typical Order of Execution.

- Account Setup: Details the steps involved in setting up an account with Deviceworx customer service. Customers simply have to provide info to Deviceworx at this stage and Deviceworx customer service will handle the rest.
- Player Setup: Outlines how to physically connect a player device to a screen, a power source and an Ethernet connection (or how to connect to a customer Wi-Fi Access Point as an option to Ethernet).
- Dashboard Access: Shows the user how to login to the C4DS Dashboard. Dashboard functions are accessed within individual tabs (described in subsequent sections).
- Dashboard Device Tab: Describes how player devices are listed and the configuration data provided within the device list. Additionally, this section describes how individual or groups of devices can be configured and what configuration parameters can be changed along with their meanings.
- Dashboard Ad Manager Tab: Provides details on how advertising files or other content are uploaded to the C4DS Dashboard (along with supported file types), how campaigns are created to play a file collection and how animations between the content display transitions are set. This section also provides detail on optional campaign features including scheduled campaigns and internet radio playback during campaigns.
- Dashboard Reports Tab: Shows how to view proof of play reports. This includes selection of filter criteria and exporting of report results.
- Dashboard Administration Tab: This section describes completely optional C4DS functions such as creating additional users and setting up device locale for grouping of devices for listing and reporting purposes.

1.4.1 Expanded Scope

Note that this document covers C4DS digital signage functionality only. The C4DS dashboard supports beacon proximity marketing (in addition to signage). Dashboard functionality supporting beacon proximity marketing is not covered within this document, but is covered within the xPLAYER Users Guide. The more-expensive xPLAYER supports both digital signage and beacon proximity marketing. Note that a cost-effective option for set top box player operators is the installation of battery powered xTAG BEACON devices near set-top box players to get beacon proximity marketing features without the expense of xPLAYERs. Consult Deviceworx sales (sales@deviceworx.com) for more details on the addition of beacon proximity marketing to your advertising network.

2 Account Setup

Deviceworx customer service will setup a new customer account including access credentials. Customers will be provided with a link to the C4DS Dashboard along with these credentials that they can then use to login to the Dashboard. All player devices purchased by the customer will be provisioned within this account. Users will be able to view a list of all provisioned player devices after they login. The device list will be the first screen shown after login. Below is a screen capture showing a single device within a customer account.

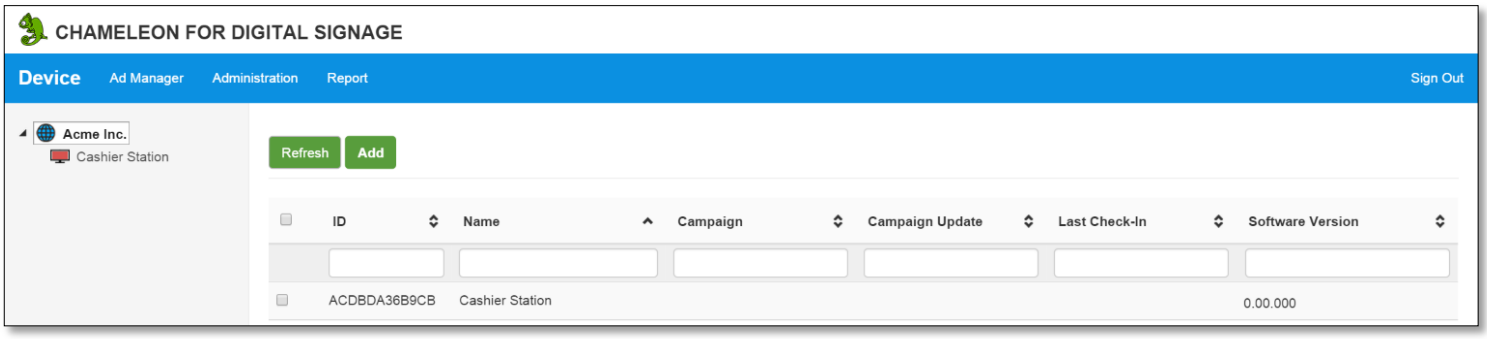


Figure 2 - New Account with Single Device Listed

To simplify account setup, customers should provide Deviceworx customer service with the information listed below. Then, Deviceworx can preset this data and administration tasks will be minimal.

- A company name (e.g. Acme Inc.). This is typically a formal company name.
- A desired account name (e.g. acme). This is a short name or label for the customer that can be quickly entered whenever account login is required.
- A desired administration username (e.g. acme_admin) for login.
- A desired password (e.g. aCm3_231$) for login to the administration user.
- A desired player name for any purchased players (e.g. "North Wall Player").
- A desired time zone for the company head office (used for reporting purposes).

Note that pins are no longer required for modern players but pin entry is still shown on dashboard screens for backward compatibility for older players.

2.1 Subsequent Provisioning

Whenever customers purchase additional player devices, Deviceworx will automatically provision these devices under their account. This occurs before the devices are received by customers. For this reason, additionally purchased units may show up within a customer's device list before they are delivered to a customer's location. See the screen cap below as an example of how a newly purchased player device (with customer specified name "Store Entrance") is shown.

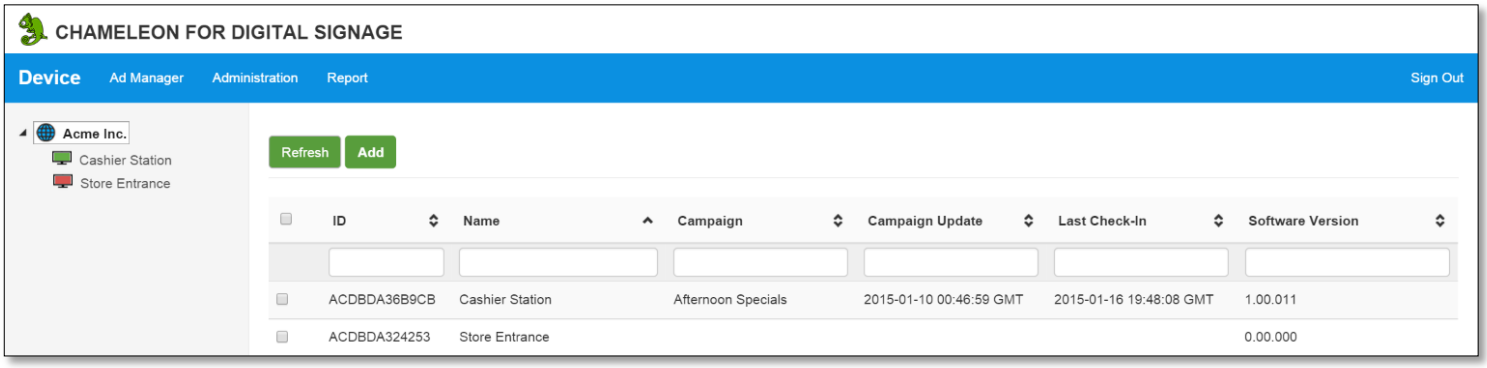


Figure 3 - Provisioned Device Enroute

3 Player Setup

This section contains detailed instructions for initial setup of C4DS Players.

3.1 Set-top Player Box Contents and Connections

C4DS Set-top Box Players ship with the contents listed below.

- XRS 4500 Player
- Bluetooth Remote Control
- Remote Control Batteries
- Player Power Supply
- HDMI Cable

Not included with the package are the following optionally used items.

- USB connected mouse (as a more ergonomic alternative to using the remote for moving the screen pointer).
- Optical audio cable (for higher fidelity connection of an external audio amplifier).

3.1.1 Connection to a Screen

Use the HDMI cable to directly connect a screen to the set-top player. Note if a longer cable is required, purchase one from a variety of electronics retailers. Any HDMI version 1.3 compatible cable will suffice for 1080p graphical support. For 4K or UHD support, purchase a cable supporting HDMI 1.4. Vendors may label HDMI 1.3 cables as "Standard HDMI" cables and HDMI 1.4 cables as "High Speed HDMI" cables. Both cable types are available in lengths to 15 meters (49 feet).

If using a screen that does not support HDMI, but supports DVI instead, purchase a DVI to HDMI adapter for direct mount to the screen and then utilize an HDMI cable to connect to the adapter. Below is a picture showing what these adapters look like.

Figure 4 - DVI to HDMI Adapter

As another option, a cable supporting DVI connection to the screen and HDMI connection to the set-top player can be purchased in lengths to 15 meters (49 feet). This option may be cheaper if the HDMI cable provided with the player is not long enough for the install (i.e. cheaper than purchasing both a longer HDMI cable and DVI to HDMI adapter). Below is a picture showing what these cables look like. Ensure that the cable meets the standards described above for either 1080p or 4K (UHD) screens.

Figure 5 - DVI to HDMI Cable

3.1.2 Connection to Power

The power supply included with the set-top player has pins matching North American power system standards, but this supply supports all voltages and frequencies in use worldwide (100 to 240 Vac at either 50 Hz or 60 Hz). Simply utilize a pin adapter to use this supply outside of North America. Alternately, contact Deviceworx Sales (sales@deviceworx.com) when placing volume orders to receive an alternative power supply with your player that directly supports your local power system (i.e. no pin adapter required).

Plug in the power supply at the set-top player and then plug in the power supply to a wall plug to boot the player. Consider avoiding a wall plug that may be turned off when a power switch is turned off to avoid frequent power cycling on the set-top player. As the set-top player uses negligible power, it should be left on all the time. Connected screen power can be turned off whenever a digital sign must be turned off (i.e. via screen remote control).

3.1.3 Connection to the Internet

An internet connection is required for player devices to support device communications with the dashboard. These communications support content updates, updating content playback statistics and acquiring web page captures.

The simplest way to connect a player to the Internet is via Ethernet. Purchase an Ethernet cable that is the correct length for the install. Maximum Ethernet cable length is 100m (300 feet). These cables are sometimes called patch cables and are Category 5e or 6 (i.e. cat5e or cat6). Note that "crossover" cables cannot be used (incorrect pinout). Patch cables must be used. Simply plug the Ethernet cable into the "LAN" port (found on the back of the set-top player) and then into an Internet router.

If an Ethernet connection is unavailable, connect the player to the Internet using an available Wi-Fi wireless network. Note that an Ethernet connection is strongly preferred as Wi-Fi network connections are susceptible to noise and configuration changes (e.g. Wi-Fi Access Point name and password changes). Wi-Fi connection steps are identical for set-top and tablet players and require screen interaction (described within a section that follows). See **Error! Reference source not found.** - REF _Ref409018540 \h * MERGEFORMAT **Error! Reference source not found.** for details on making an Internet connection using Wi-Fi.

Note that player internet connection reliability and speed is very important. Without a reliable connection, operators will never know whether their player is not functioning or simply cannot talk to the dashboard. Unnecessary site visits may be required to simply verify that a player is fully operational, but lacking a connection. Using Ethernet, instead of Wi-Fi, will support a connection that is more reliable. If a player's connection is slow, campaigns that include large content files such as videos can take hours to download and have a higher likelihood of corruption. A connection speed of at least 10MBit/sec is recommended whenever video playback is to be supported.

3.2 Initial Start-up

After a screen connection is made and power is applied to the player, it will start. One or more Android splash screens may be shown during the player startup cycle. After the player starts Android, C4DS player software that is pre-installed on the system will automatically boot and show a "Starting" status screen similar to the figure below.

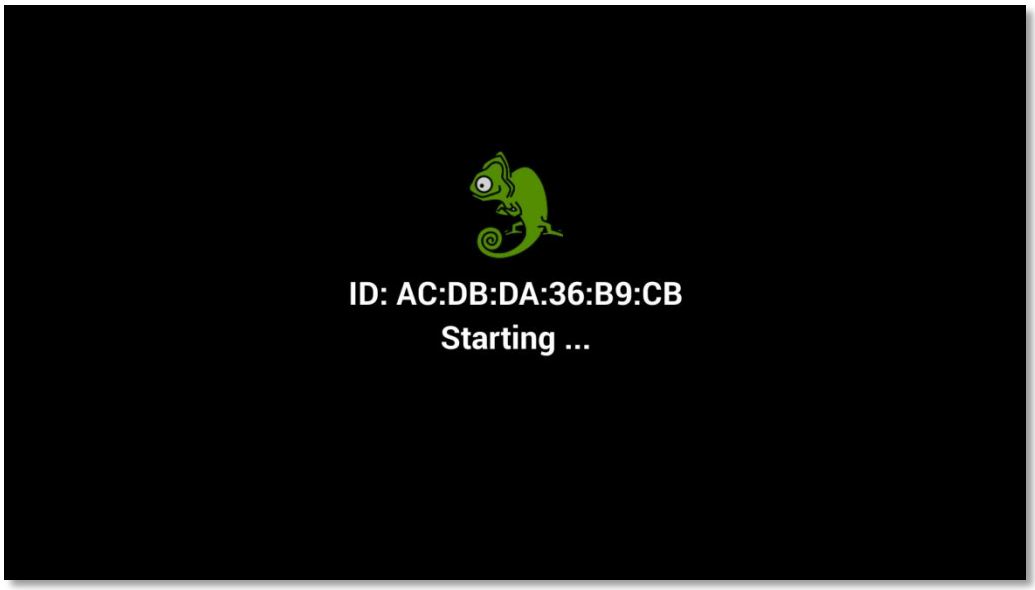


Figure 6 - Starting Status Screen

This status screen will be shown for approximately 30 seconds as C4DS software initializes. During this startup, C4DS player software will communicate with the dashboard to download any configured ads and campaigns. To support this communication, an Ethernet or Wi-Fi connection to the Internet must be made.

At the end of the startup cycle, the selected campaign will begin to play. If there is no setup or selected campaign, a "Playback Error" status screen will be shown similar to the figure below.

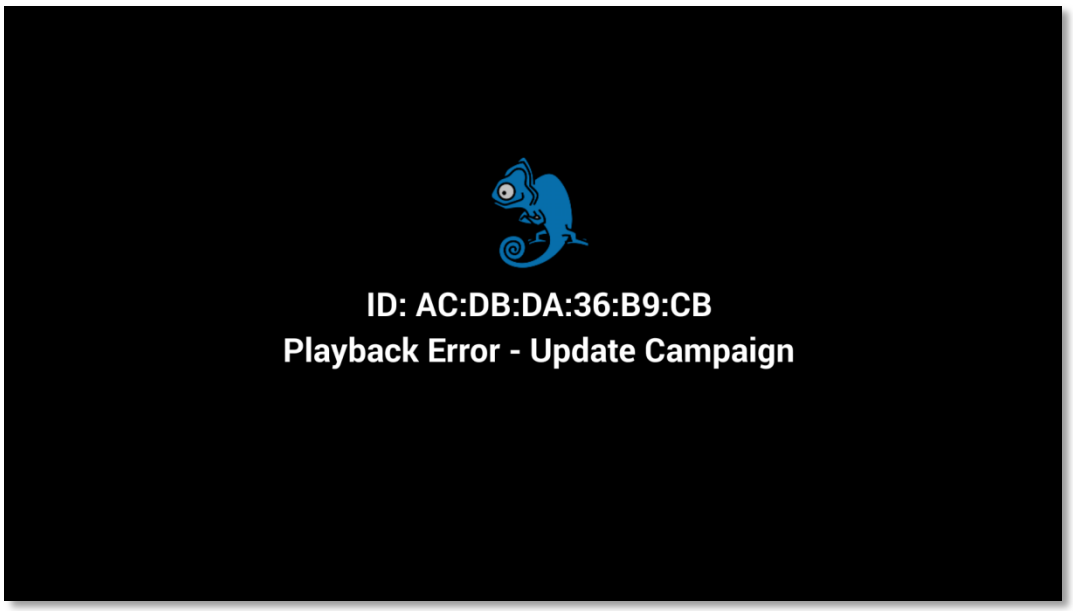


Figure 7 - Playback Error Status Screen

Note that the Playback Error status screen may be shown after C4DS startup if C4DS software has not finished downloading all content files configured for a selected campaign. If this occurs, the Playback Error status screen will automatically disappear and the selected campaign will automatically play after all content file downloads to the player have completed.

3.3 Screen Interaction

Remote and remote batteries are provided with all set-top boxes. This remote uses Bluetooth for communications with the player and therefore must be within 10-15 feed to work. The important buttons on the remote are shown below.

Figure 8 - Remote Buttons

Select the "Home" button at any time to get to the Android User Interface (UI).

When in the Android UI, use the "Touchpad" (with "OK" select button) to jump between and select icons within the Android UI. Each ICON represents an app, or app group. The only 3 icons that should be selected are:

- "All Apps" is a group with the "C4DS" app. Select the C4DS app to restart it after settings are updated.
- "Settings" is an app supporting the alteration of player settings.
- "WiFi" is an app supporting Wi-Fi setup and Ethernet status.

Use the "Back" button to go back to the Android UI.

Select the "C4DS" app icon within the "All Apps" group to leave the Android UI and restart the digital signage functionality.

Note that xrs 4500 setup details are not covered in detail within this guide. See separate xrs 4500 documentation for those details (https://buzztv.com/site/wp-content/uploads/2021/03/BuzzTV-XRS4900-Manual.pdf).

4 Dashboard Access

All C4DS player content control and monitoring is accomplished using the C4DS dashboard. C4DS users access the dashboard by first opening the general Deviceworx dashboard access page at ops.deviceworx.com (shown below).

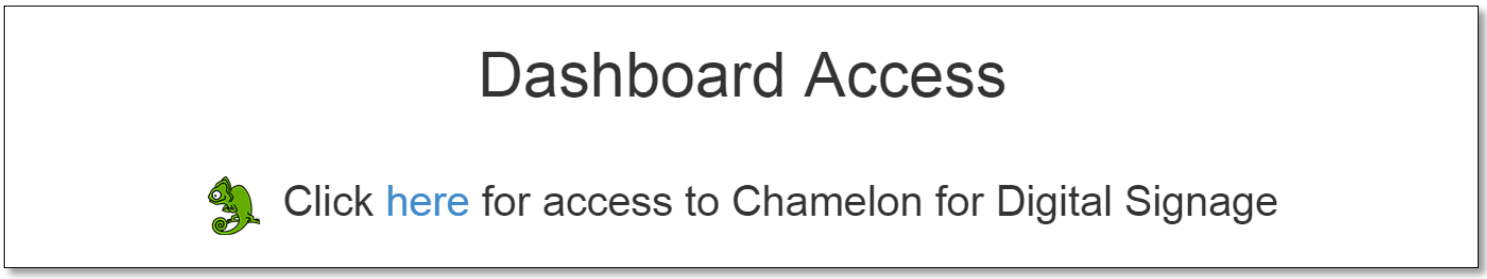


Figure 9 - Deviceworx Dashboard Access

This page supports accessing all Deviceworx dashboards.

After selection of the "Chameleon for Digital Signage" dashboard, users must login to the C4DS dashboard as shown below.

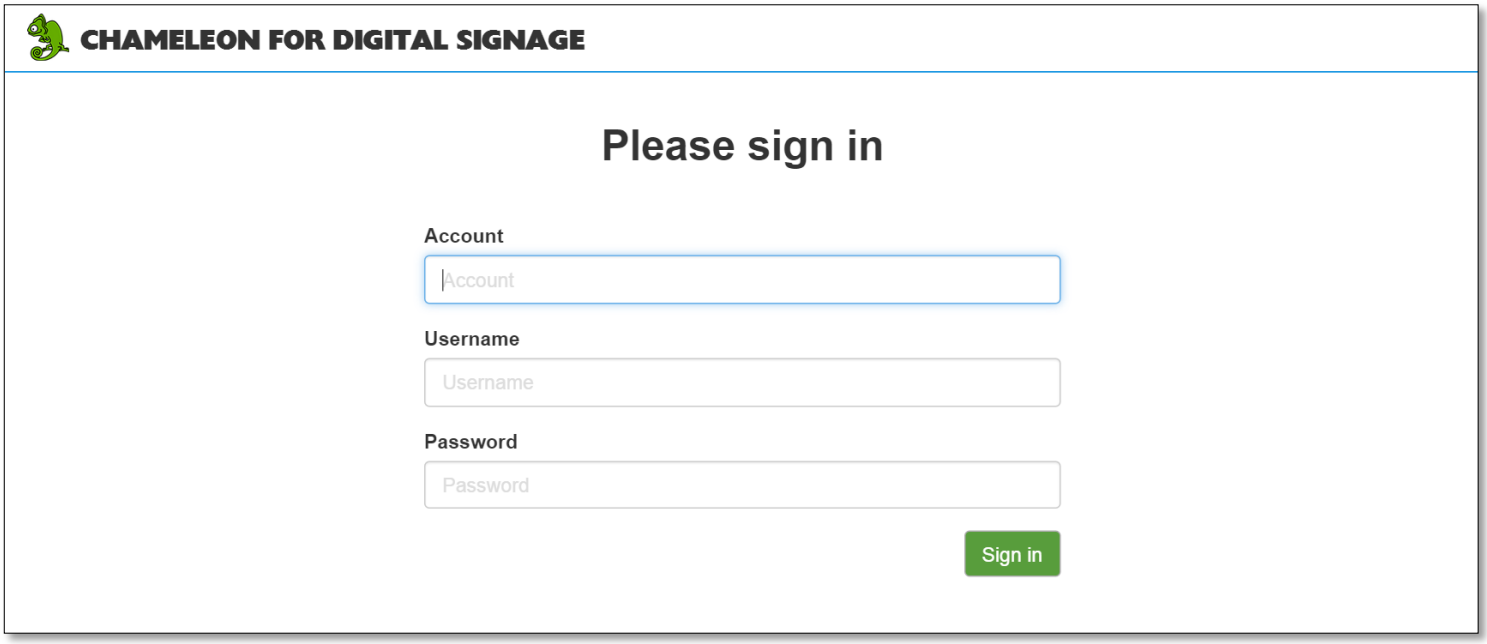


Figure 10 - C4DS Dashboard Login

Enter the Account, Username and Password provided to you by Deviceworx customer service and discussed within 2 - Account Setup. After login, the C4DS dashboard will be opened and the Device tab within the dashboard will be selected by default. Controls within this tab and their use are discussed in detail within section 5 - Dashboard Device Tab that follows.

5 Dashboard Device Tab

The "Device" tab is selected automatically after each user login. This tab, like all others, can be selected at any time within the blue dashboard header. The selected tab is always highlighted and slightly larger than de-selected tabs. When the "Device" tab is selected the device tree and list will be shown.

5.1 Device Tree

The figure below shows a typical device tree for a customer with two players: one running (Green) and one disconnected (Red).

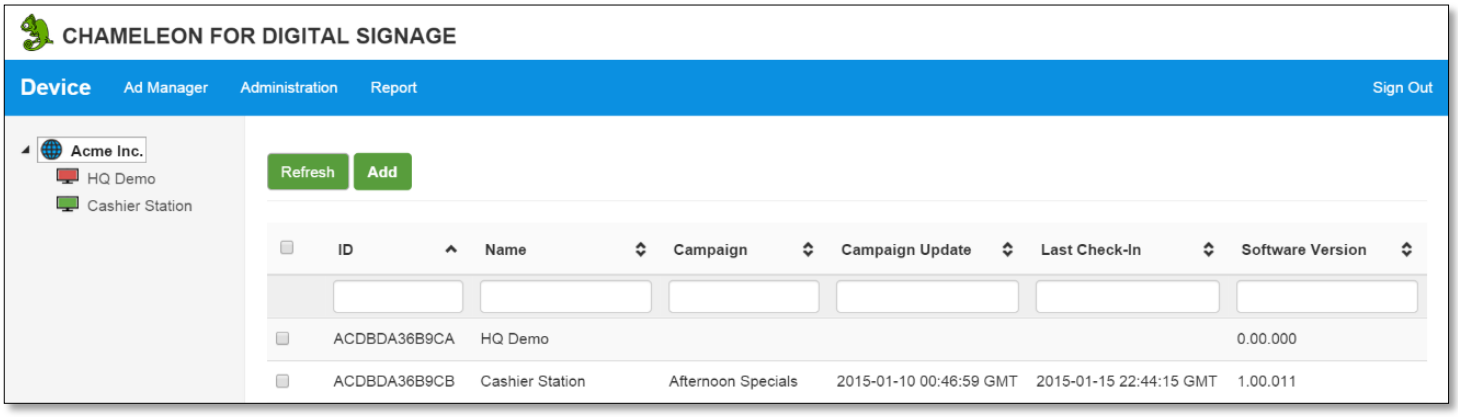


Figure 11 - Basic Device Listing

The tree control on the left side of the screen shows all players assigned to a customer account. The trunk of the tree is the customer ("Acme Inc" in the figure above). Within their system, customers can define geographic divisions, sites and departments. This definition is described in detail (as device "Locale") within section 8 - Dashboard Administration Tab that follows. When defined, these geographic areas are shown as branches within the tree. Players can be allocated directly under a customer account (i.e. directly under the trunk of the tree) or within a descriptive division, site or department. In Figure 11 - Basic Device Listing, both players are allocated directly to "Acme Inc".

Player icon colors represent their current connection status. Players represented by a red screen icon have not communicated with the dashboard in more than 5 minutes. Players represented by a green icon have communicated within the last 5 minutes.

The figure below shows an updated "Acme Inc" account wherein customer locales are added and players are added to these locales.

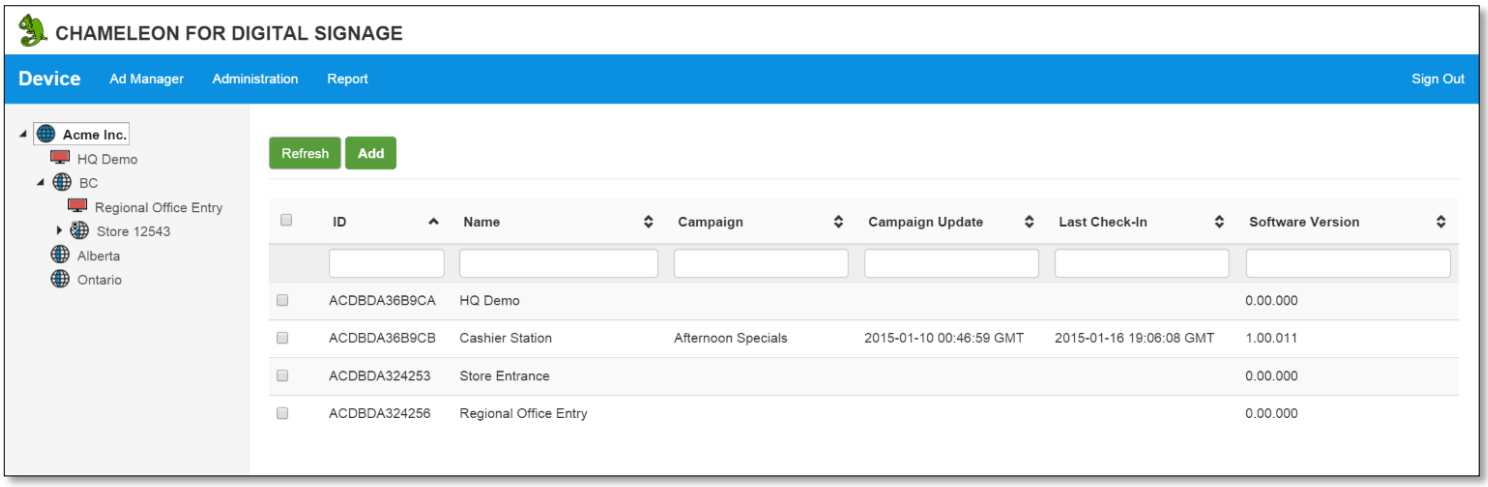


Figure 12 - Device Listing with Closed Branches

The figure above shows customer-defined divisions. For "Acme Inc", each division denotes a Canadian province. The "HQ Demo" player is shown outside of these divisions as this player is not assigned to any locale (division, site or department). The "HQ Demo" player is assigned to the customer account directly under the trunk of the tree. A triangle is next to the "BC" division indicating that it includes sub-branches. Open the "BC" division by clicking on the triangle next to it. The result is shown in the figure below.

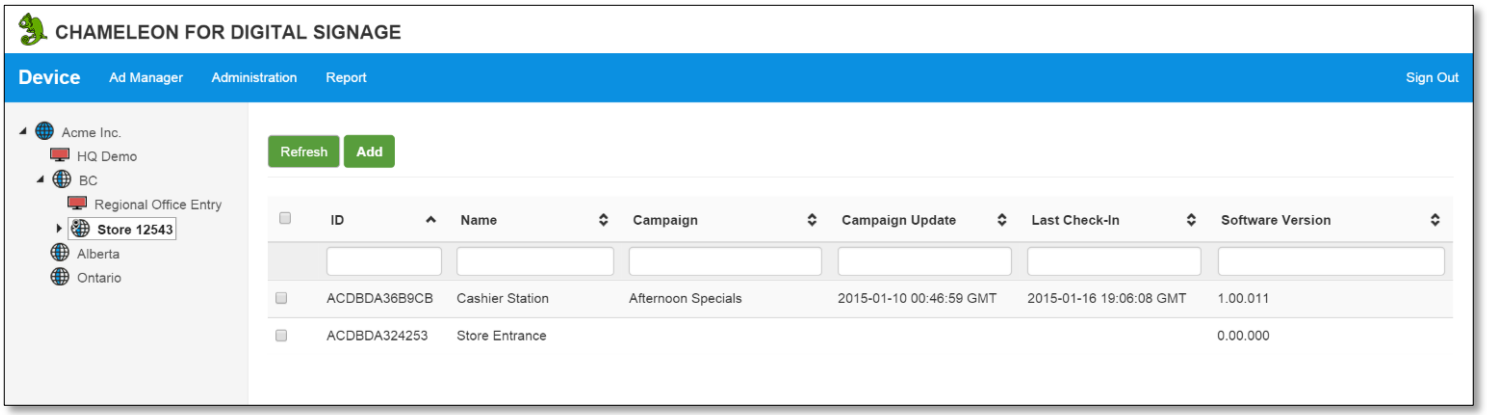


Figure 13 - Device Listing with Open Division

Now, a "Regional Office Entry" player (assigned to the "BC" division) is shown in the tree in addition to the "HQ Demo" player. A site under "BC" called "Store 12543" is also shown in the tree. A triangle next to "Store 12543" indicates that there are additional sub-branches within it.

Note that when selecting "Store 12543" (as in the figure above), the list on the right side of the screen only shows two players within "Store 12543" (i.e. those players under "Store 12543" in the tree). When any branch of the tree is selected, only players under that branch are listed.

Opening "Store 12543" (by selecting the triangle next to it) results in the screen below.

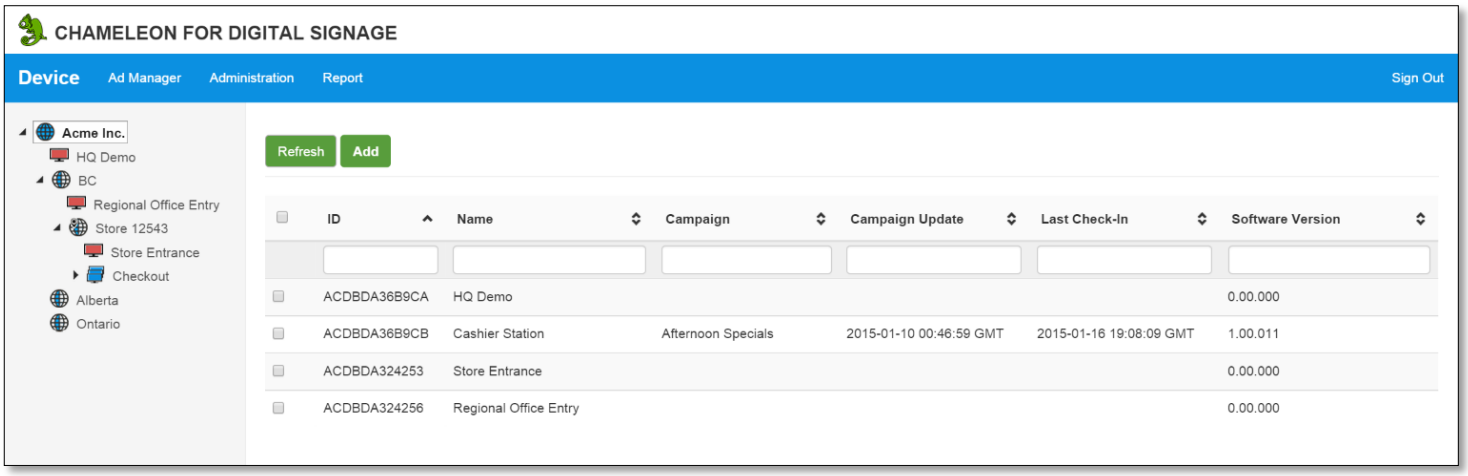


Figure 14 - Device Listing with Open Site

Now, a "Checkout" department is listed with a triangle indicating that it contains another element. A "Store Entrance" player is also shown in the tree as this player is assigned to the now open "Store 12543". The selection within the tree control is now "Acme Inc.", so all devices are shown within the list (i.e. regardless of their locale). Open the "Checkout" department by selecting the triangle next to it. The resulting screen is below.

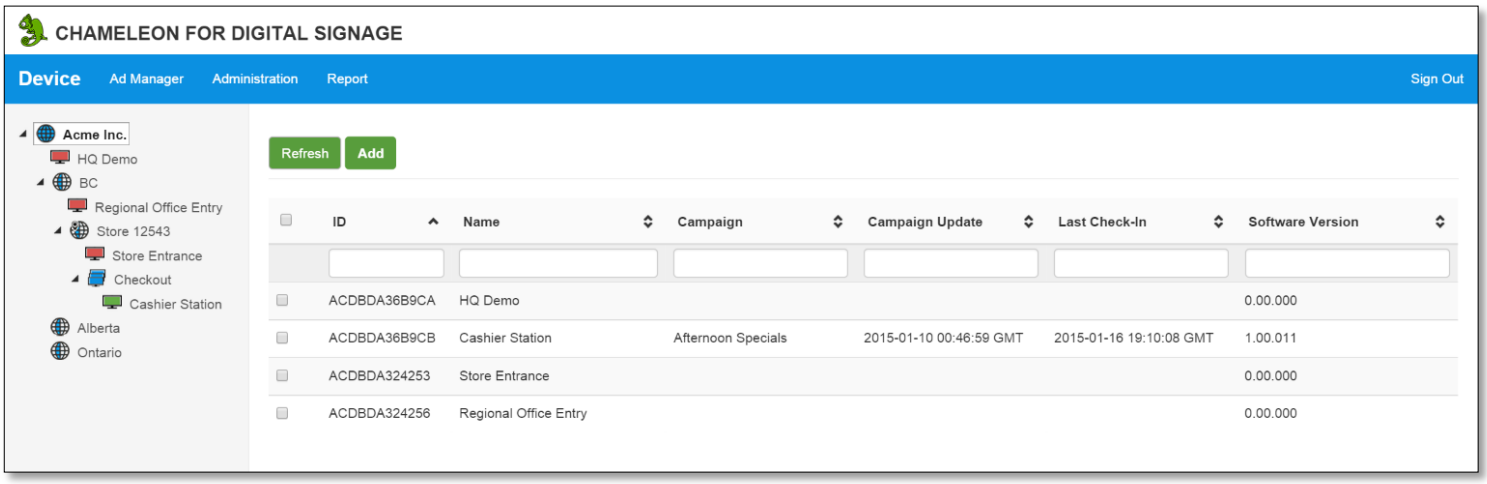


Figure 15 - Device Listing with Open Department

In the figure above, all tree branches under "BC" have been opened and all players under the defined division ("BC"), site ("Store 12543") and department ("Checkout") are visible within the tree. Because the trunk of the tree ("Acme Inc.") is still selected, all players are listed. Player connectivity state is clearly indicated based on the player icon color within the tree.

Below are some general notes regarding the player device tree control and list:

- The trunk of the tree shows the customer label and any players directly assigned to a customer (not to any locale) are directly under this trunk.
- When any branch shows a triangle on its left, it contains hidden tree elements. Selection of the triangle shows these elements. Subsequent triangle selection hides these elements.
- Selecting any branch lists all players under that branch (including sub-branches) on the right of the dashboard page. Selecting the trunk lists all customer players.
- Branches describe locales that include divisions, sites within divisions and departments within sites. These locales are setup within section 8 - Dashboard Administration Tab.

5.2 Device List

Whenever the customer trunk or sub-branch to the trunk is selected within the tree control on the "Device" page, the list on the right of the "Device" page will change to list all players under the selected trunk or sub-branch. The figure below shows all players assigned to "Acme Inc" (after the trunk is selected).

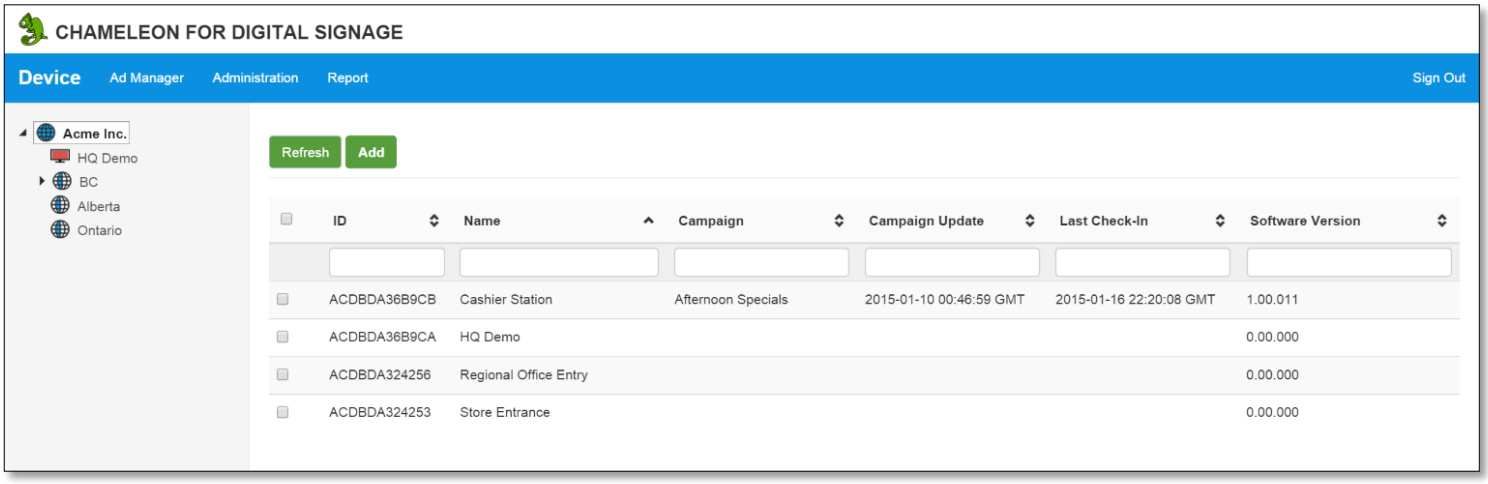


Figure 16 - Full Customer Player Device List

The list contains the following fields:

- ID: The unique identifier for each player within the C4DS system. This ID is shown on the player screens during startup. This ID is helpful in matching installed players with their dashboard configuration. Note that this ID may also be found on a label attached under set-top box players.
- Name: A friendly name that customers assign to each player to help identify where they are installed and what kind of content they are used to display.
- Campaign: The last selected campaign for the player. Campaigns are lists of advertising or other content for screen playback and are described in detail within 6 - Dashboard Ad Manager Tab.
- Campaign Update: The date and time (Greenwich Mean Time or GMT) when the last selected campaign was downloaded by the player.
- Last Check-In: The date and time (GMT) when the player last communicated with the C4DS dashboard.
- Software Version: The version of C4DS player software currently running on the player.

5.2.1 Selecting Players

Player devices are commonly selected so that they can be deleted or modified individually or in groups. After selecting one or more players, "Modify Selected" and "Delete Selected" buttons are shown above the list. The figure below shows the selection of two players and these buttons.

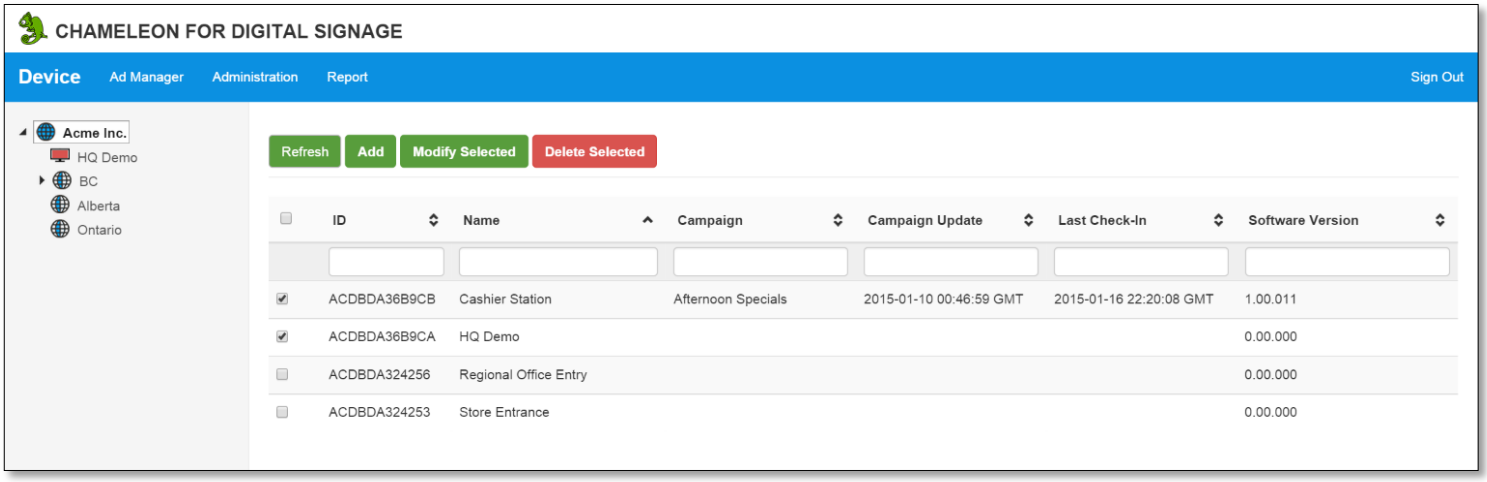


Figure 17 - Multiple Player Selection in Device List

To select any player, check the checkbox (☐) next to it. Select additional players as required by checking the checkbox for each player. Select the checkbox at the top of the list to select all listed players. Un-checking this top checkbox de-selects all listed players.

Modification of players is discussed in detail within section 5.4 - Device Attributes and Setup. If a single player modification is required, simply clicking on the player in the list will open the form that supports editing device details (described in 5.4).

Deletion of players is discussed in greater detail within section 5.3 - Adding / Deleting Devices.

5.2.2 Sorting Players

The list can be sorted based on any of the fields. Select the ⇕ icon next to the field on which to sort. This icon is visible within the list header. An initial sort that is top down will be made. Field items will be sorted lowest (top) to highest (bottom) based on alphanumeric values (0 through 9, then a or A through z or Z). The sort icon will be changed to ⌃ . Select this icon to change the sort to be highest to lowest. The sort icon will then be changed to ⌄.

5.2.3 Filtering Players

Filter boxes are provided directly below the device list field labels (e.g. "ID", "Name", etc). Entering filter text within these boxes will dynamically change the device list to ONLY list players with field data that include the filter text. For example, entering filter text "Entry" within the "Name" filter box will result in a full customer list automatically truncating to list only players with "Name" values that include " Entry" as shown in the figure below.

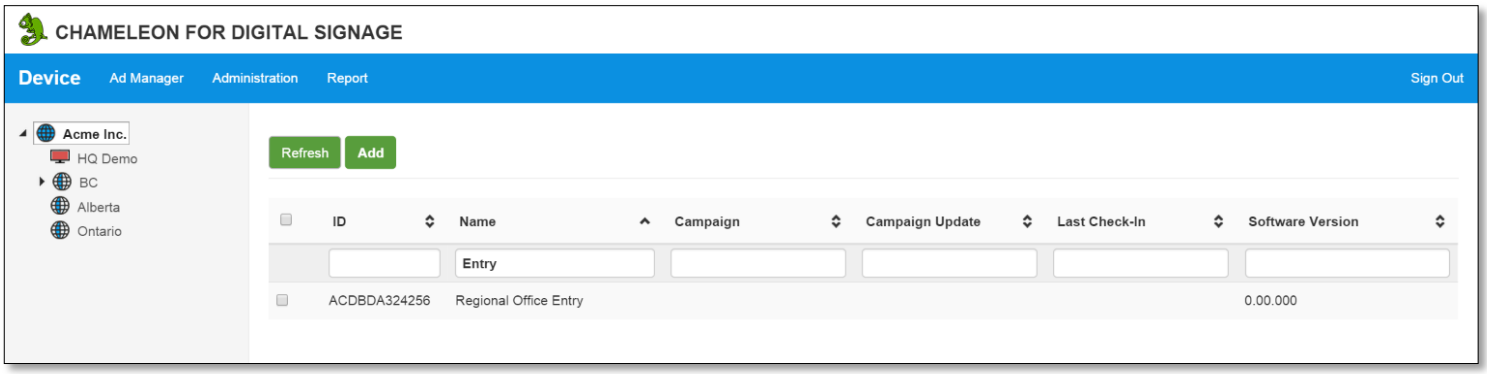


Figure 18 - Filtered Device List

5.2.4 Refreshing

List controls are updated infrequently. For immediate refresh of screen contents, select the "Refresh" button provided. Note that using the browser refresh will completely reload the Device page and some page contents will revert to their default state.

5.2.5 Suggestions for Use

The device list supports these common tasks:

- Quick reference of players within a given locale (division, site or department).
- Easily locate a named player within a large network where player locale is unknown. By viewing all players (listed after selecting the tree control trunk) and then sorting based on "Name", a specific player can be found within a network. Alternately, use the "Name" filter to find the player within the list.
- Easily locate a player based on "ID" where locale is unknown. View a listing of all players and then sort on "ID" or utilize the "ID" filter.
- Determine which players (system wide or within a selected locale) are running a specific campaign. Sort on "Campaign" or use the "Campaign" filter after selection of a device list.
- Track disconnected players (system wide or within a selected locale) by sorting on "Last Check-In".
- Selection of multiple devices for modification or deletion.

5.3 Adding / Deleting Devices

Devices are commonly provisioned within the C4DS dashboard by Deviceworx customer service. If required, customers can delete and add devices within the dashboard. Large customers may, for example, purchase a large volume of player devices and may only wish to provision player devices within the dashboard when these devices are pulled from storage and put into use. This will reduce the number of visible devices in their list and improve their system manageability.

To add a player, select the "Add" button that is always visible above the device list. This will open a device details form that includes an entry for "ID", "Name" and many other player details. As a minimum, enter the "ID",a "Name",select a timezone for the player and then select the "Save" button within the form. The newly added device will then be included within the player device list. To obtain the ID for a player, restart it. The ID can be viewed within all C4DS screen savers including the C4DS start-up screen. On set-top players, this ID is also visible on the label attached to the bottom of the player.

Deleting players is as simple a selecting them within the list and pressing the "Delete Selected" button (shown in Figure 17 - Multiple Player Selection in Device List above).

5.4 Device Attributes and Setup

Player device attributes are changed by selecting one or more players within the device list. Selecting a single device (by clicking on it within the list or tree control) opens an attributes form within the "Device" tab to the right of the tree control. This form displays all player attributes and supports editing all attributes with the exception of the "Device ID", which can only be set when adding a player to the dashboard. Player attributes are shown in the example figure below.

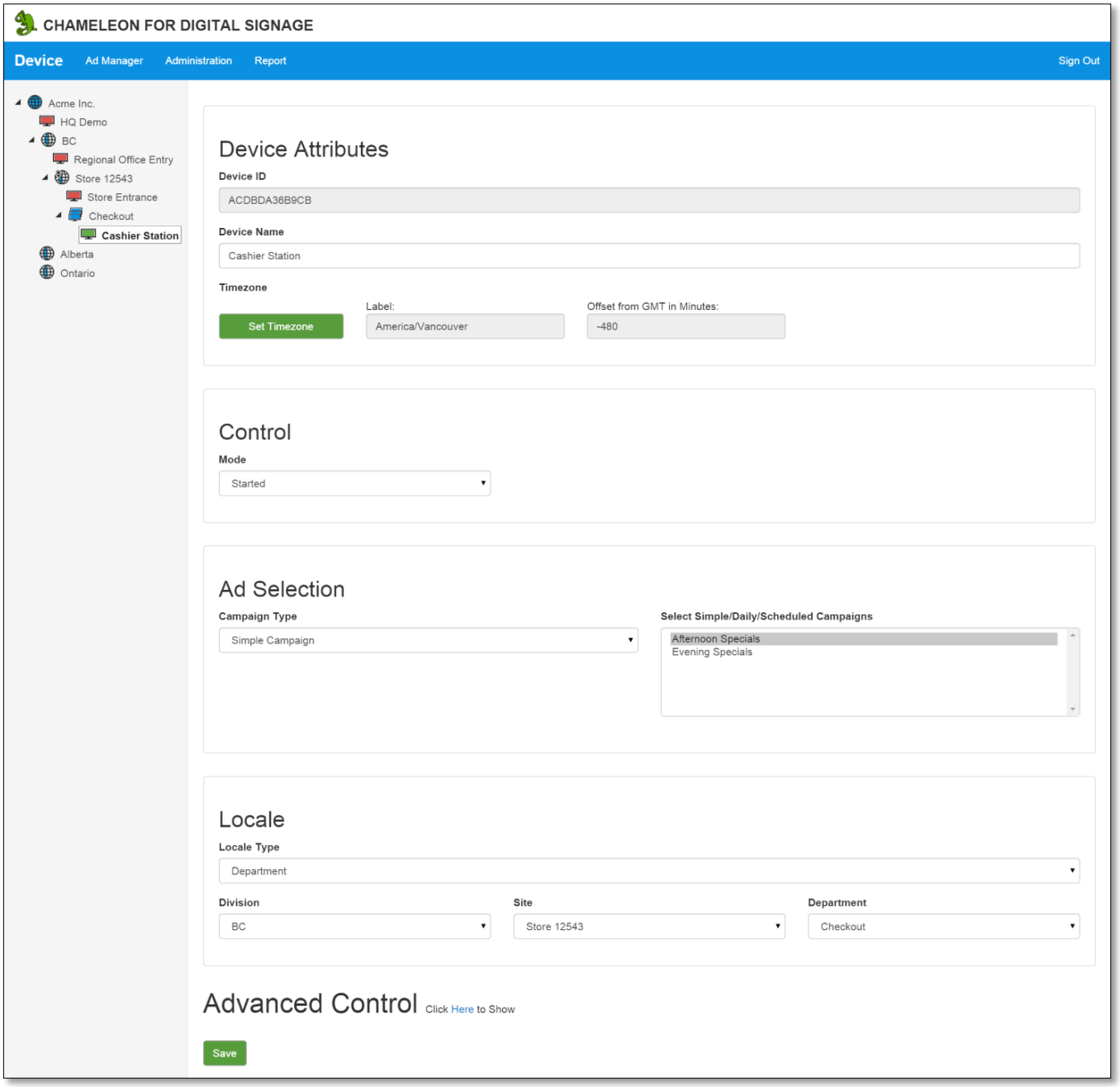


Figure 19 - Attributes for a Single Selected Player Device

All standard attributes are listed within the form shown in the figure above. "Advanced Control" attributes (described in a section that follows) are infrequently edited and may be ignored by most users.

Editable attributes are:

- Device Name: A name typically describing the player location or display category (e.g. "South Wall" or "Daily Specials").
- Timezone: The timezone in which the player has been installed. Select the "Set Timezone" button to open the "Region Offset" window as shown in the figure below.

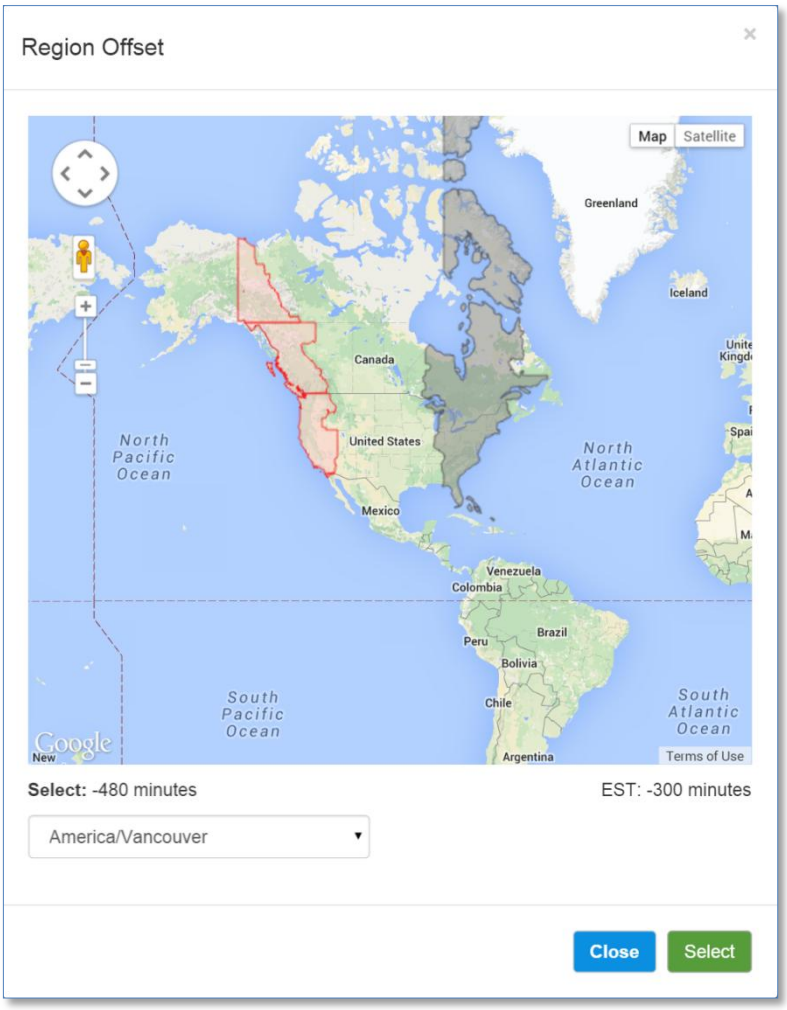


Figure 20 - Region Offset Selection Window

Within "Region Offset", specific locations are listed below the map ("America/Vancouver" in the figure above). To change the selected timezones elect the exact player location (or nearest location in the same timezone) from the list below the map.

- Control: Control provides a means for remote disable of playback if required. When playback is "Stopped", the player screen will show what is within the figure below.

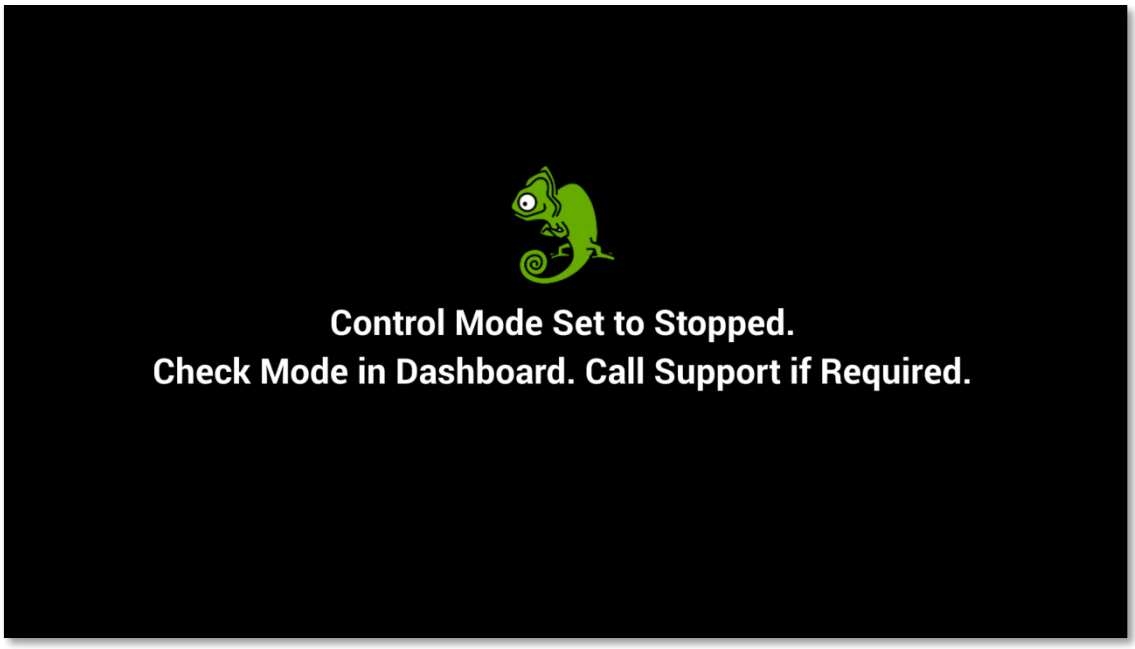


Figure 21 - Stopped Playback Control

- Ad Selection: Choose the list of ads or other content to play and their playback order, animation, timing and any independent audio playback. These attributes are all defined within one of three selectable campaign types (Simple, Daily and Scheduled). Typically campaigns are first created and then later selected as player device attributes within this form. Ads and campaign configuration are discussed in detail within section 6 - Dashboard Ad Manager Tab.
- Locale: Optionally select which defined locale group (division, site or department) that the device is assigned to. Customer locales are described in detail within section 8.2 - Locale Administration. Locales must first be defined (as described within 8.2) before they are selectable within this "Device Attributes" form.

In addition to standard device attributes, Advanced Control attributes can be displayed using the link provided. These controls are shown within the figure below.

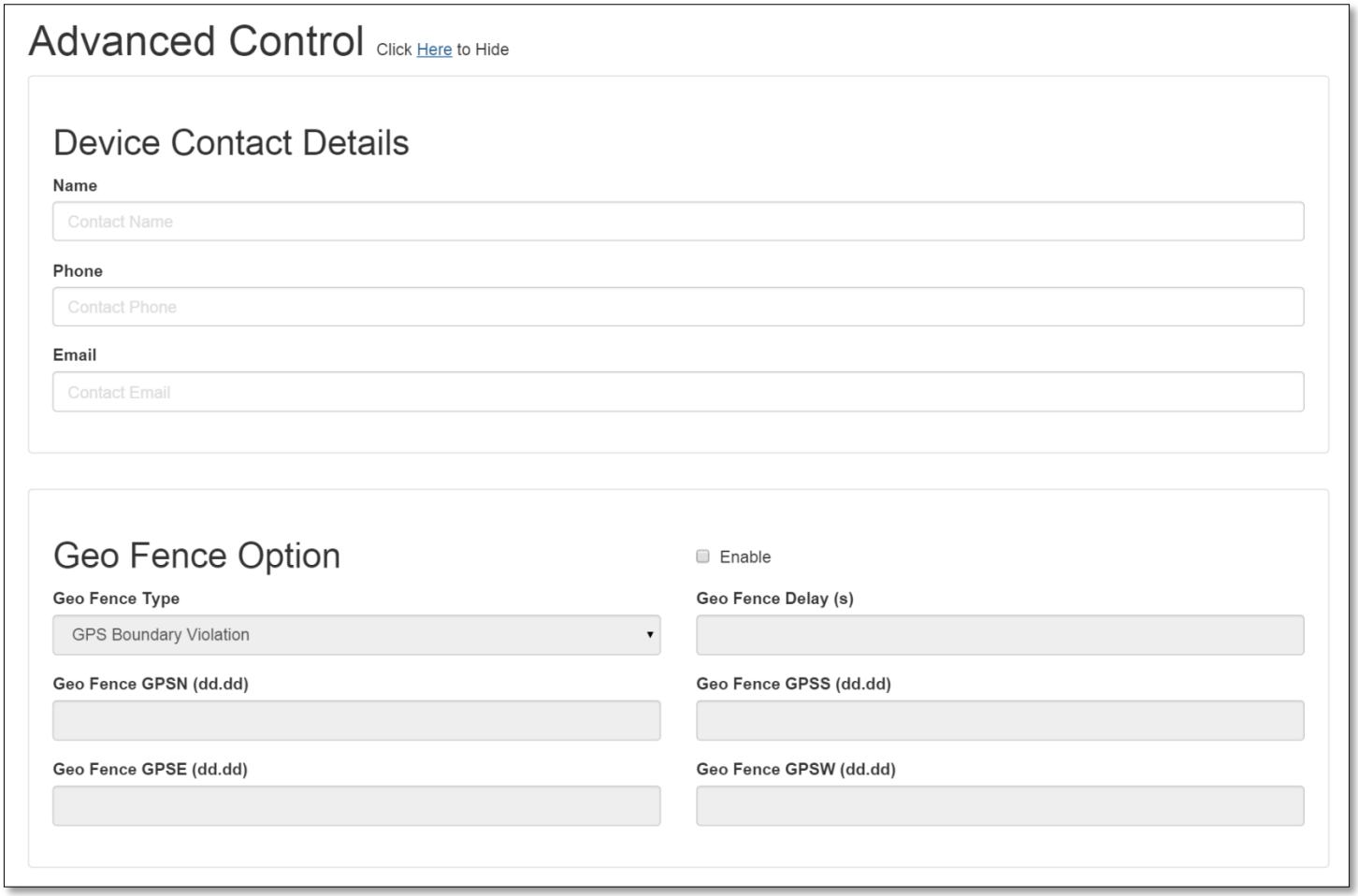


Figure 22 - Player Device Advanced Control Attributes

Editable Advanced Control attributes are:

- Device Contact Details: The Name, Phone and Email of a contact at the location where the player is installed. Typically such contacts are called or emailed when there is a problem with a player (e.g. unplugged) and local assistance is required.
- Geo Fence Option. This option supports tablets only and is not used for set-top style players.

5.5 Setting Device Attributes for Multiple Devices

The attributes for multiple player devices can be set at one time. Using the checkbox controls within the device list that are discussed in 5.2.1 - Selecting Players, select the players to be modified and then "Modify Selected". A device Attributes form **similar** to that shown in Figure 19 - Attributes for a Single Selected Player Device will be shown. This form is shown below and varies from Figure 19 only in that it does not support editing device names (must be unique for each player) and does not show a device ID (not valid when attributes for multiple devices are shown as each device has its own unique ID).

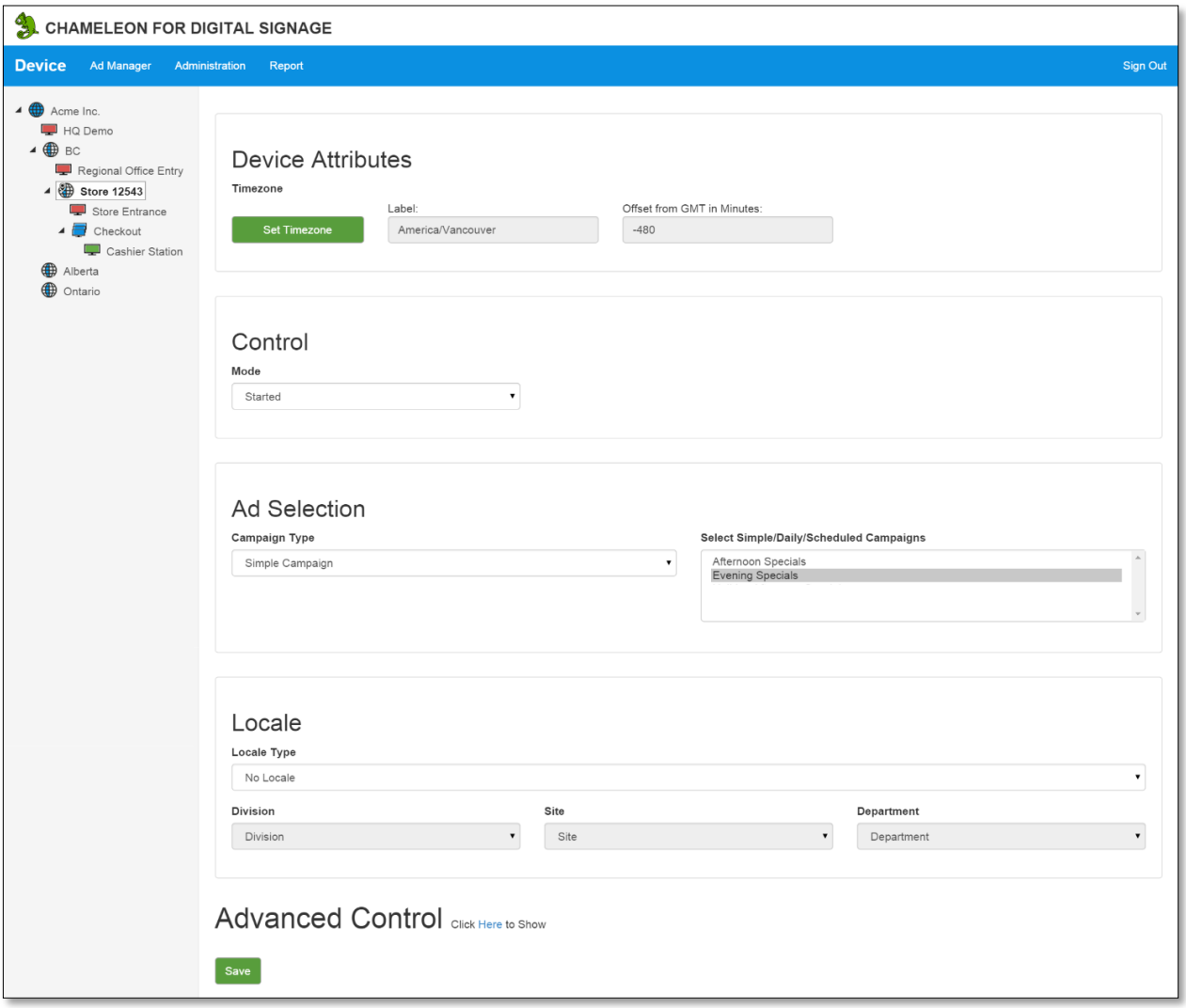


Figure 23 - Attributes for Multiple Selected Player Devices

6 Dashboard Ad Manager Tab

Forms within this tab support uploading of ad files and selecting how those ads are played within ad campaigns. Once ads are uploaded and defined within campaigns, these campaigns can be selected for playback within players.

6.1 Supported Ad File Types

The following static graphic file types are supported by C4DS:

- .png
- .jpg

png files are strongly recommended if the original ads are to be scaled to fit the screen in any way. .jpg files should only be used when their resolution matches that of the player screen resolution.

For best results, always create graphical content matching the screen resolution used. When possible, use 4K (UHD) screens with 4K graphics (3840 x2160) as 4K graphics present products, promotions, retailer data and other messaging exceptionally well.

The following video file types are supported by C4DS (with related encoding in brackets):

- .3gp (H264, MPEG4-SP)
- .mp4 (H263, H264)
- .webm (VP8)

Videos should be encoded at a frame rate of at least 30 frames per second (fps) for smooth playback. A video resolution that matches the resolution of the player screen should be used. The exception is 4K (UHD) screens. 1080p videos should be played on 4K screens to ensure video playback smoothness.

6.2 Uploading Ad Files

Select the "Ad Manager" tab within the blue dashboard header. Within this tab, both ads and collections of ads called campaigns are shown and managed. At any time, select "Ads" from the upper left list box to view and manage ads within the dashboard or select either "Simple Campaigns", "Daily Campaigns", or "Scheduled Campaigns" to view or manage any of these campaign types (described in detail within sections of this guide that follow). Whenever the "Ad Manager" tab is selected, "Ads" are shown by default. When there are no ads within the system, the ad list will look like the figure below.

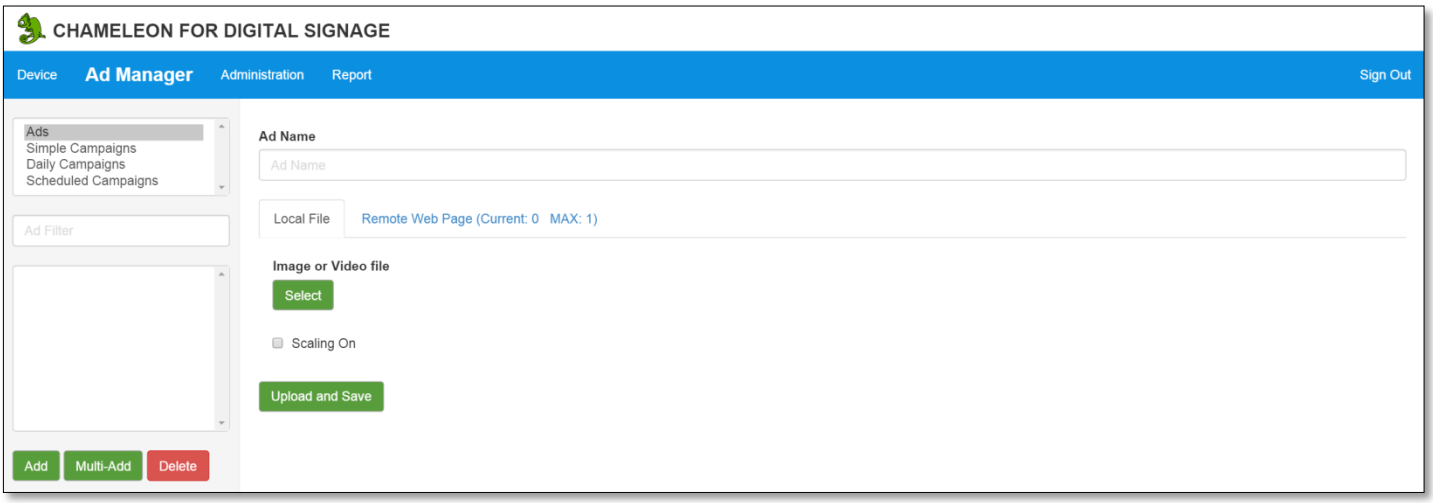


Figure 24 - Empty Ad List

Files can be uploaded individually or multiple files can be uploaded at once for efficiency.

To upload a single file, select "Add". The screen will not change from that shown in Figure 24 - Empty Ad List above. Enter an "Ad Name" that properly represents the contents of the ad, then choose "Select" to pick the file within a host PC. Next, check the "Scaling On" checkbox if scaling down to the original file resolution is required. Android will always scale image files up to the max screen resolution unless this checkbox is checked (video files are not scaled). Last, select "Upload and Save" to save the file within the dashboard and add it to the ad listing. During upload, a progress bar is shown as below.

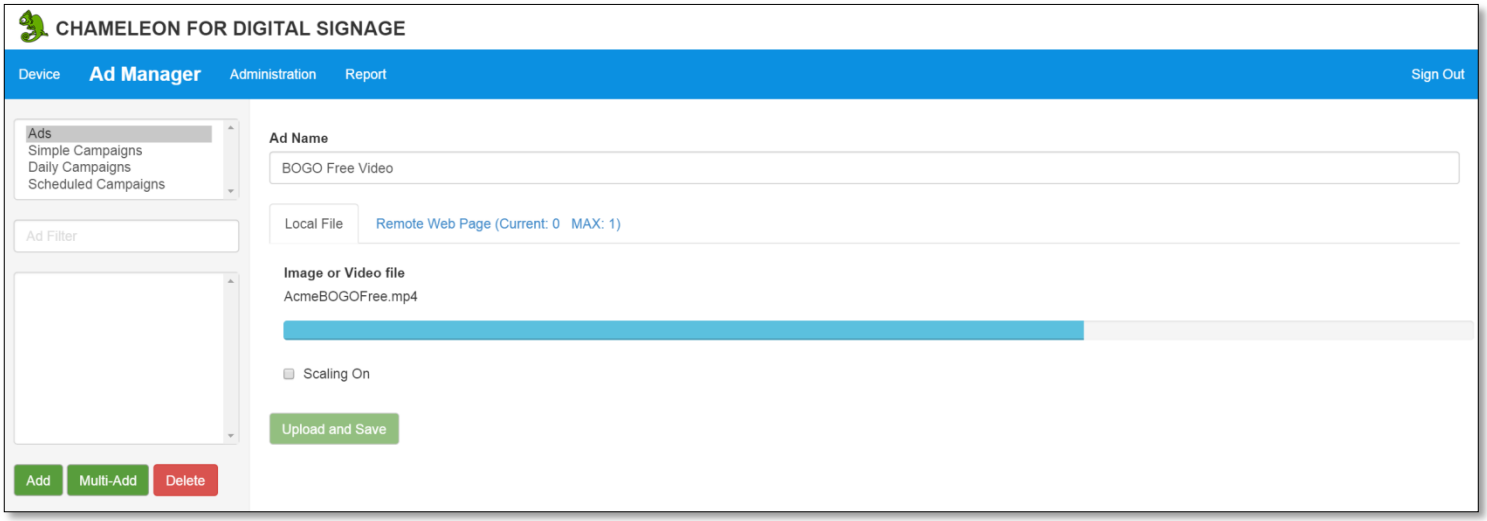


Figure 25 - Ad File Upload Progress

To upload multiple files at one time, select "Multi-Add". A form with a single button ("Select Files") will be shown. Selecting this button will open a dialog supporting multiple file selection as shown below.

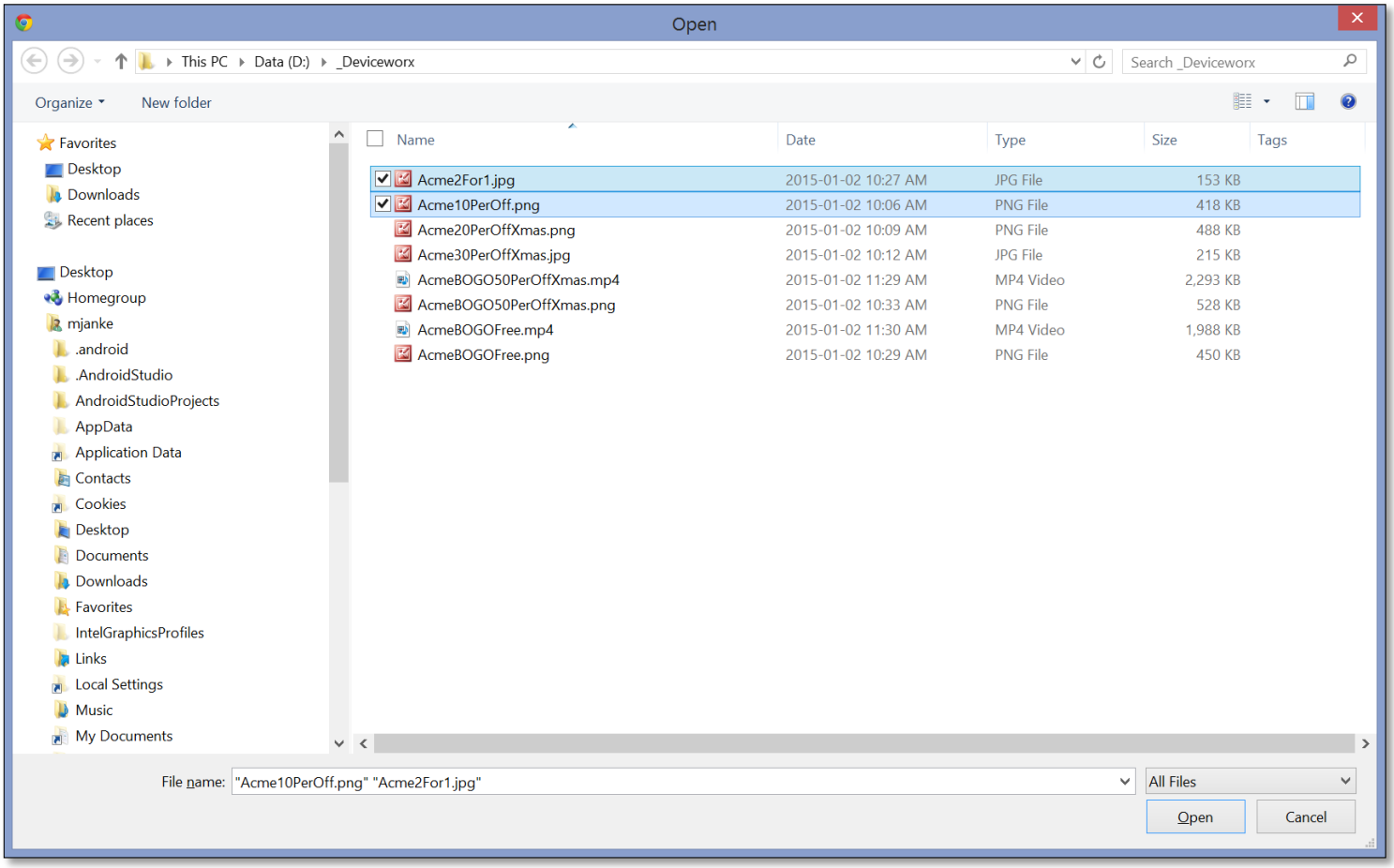


Figure 26 - Multi-File Selection Dialog Box

To select multiple files that are in sequence within the dialog, select the first file and then hold the "shift" button and select the last file.

To select multiple files that are out of sequence, hold the "ctrl" button while selecting each file.

There is no limit on the number of files that can be selected.

After selecting files, the form will show a preview of each as below.

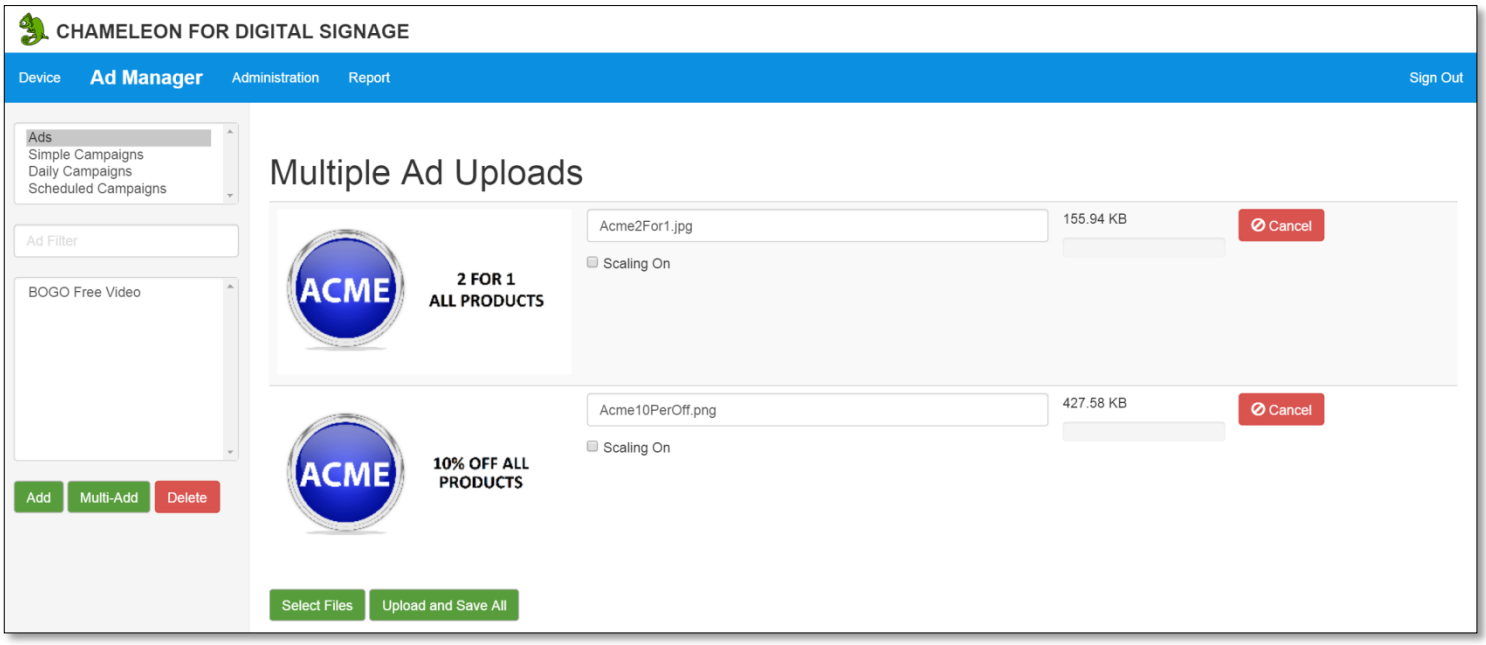


Figure 27 - Multi-File Preview

Select "Upload and Save All" to upload files in parallel. Note that only 3 files will be uploaded at a time. If more than 3 files were selected, some files will be queued up and their upload will start immediately when one of the 3 slots becomes free.

If another dashboard page is selected during an upload, a message box will be shown to confirm that the upload is to be aborted. If another web page outside of the dashboard is selected, file uploads will be aborted.

The name of the uploaded ads will be set to match their file name. Change these ad names (if required) by selecting them individually within the ad list.

6.3 Graphic Scaling

By default, graphics with a resolution that is different from the resolution of the screen used, will be stretched or shrunk to fit that resolution. For example, if an image has resolution 1280 (w) x 720 (h), and is being displayed on a 1920 (w) x 1080 (h) screen, by default this image will be stretched to 1920 x 1080 when displayed.

Figure 28 - Properly Displayed Image

Because the aspect ratio (width to height) for both of these resolutions is 16:9 and because 1280 x 720 is not that different from 1920 x 1080, this stretch may look ok. If, however, that same image with resolution 1280 x 720 is displayed on a 4K/UHD screen with resolution of 3840 x 2160 (also 16:9) ... it will look quite pixilated because it is stretched dramatically.

Figure 29 - Pixilated Image

Image distortion can also occur if an image is displayed on a screen with a different aspect ratio. For example, if a 1280 x 720 image at aspect ratio 16:9 is displayed on a narrower screen with resolution 1920 (w) x 1200 (h) with aspect ratio 16:10, it will be stretched more vertically than horizontally and look askew.

Figure 30 - Image that is Askew

To simplify image display and avoid any potential stretch or shrinkage issue, always create images with a resolution that matches the resolution of displays used. If images are displayed on multiple screens with different resolutions but, a common aspect ratio (e.g. most screens are 16:9), create images that match the largest screen resolution as images shrink more effectively than they stretch.

When image stretching or shrinking is expected, create images as PNG files as this image format stretches and shrinks better than JPG files.

If stretching or shrinking with adverse results cannot be avoided, an option is to scale the image to its original size. This terminology may seem backwards (i.e. stretching and shrinking can be interpreted as scaling), but the Chameleon system uses Android terminology and in the Android world, scaled images are shown using their original resolution within the screens resolution. Within the Chameleon Ad Manager, a "Scaling On" checkbox is provided for each image. **Check this box to show the image using its original resolution and avoid stretching or shrinking.** Ensure that the image resolution is not much higher or lower than the resolution on screens used to display the image. If the image resolution is much larger than the screen resolution, it will be cropped as shown below.

Figure 31 - Cropped Image

If the image resolution is much smaller than the screen resolution, it will be surrounded by a border as below.

Figure 32 - Bordered Image

6.4 Remote Web Page Capture

In addition to ad files, C4DS players can display captures of web pages. This supports display of information that is dynamic in nature.

While any web page can be captured, it is strongly recommended that web pages that have been developed specifically for capture are referenced. This ensures that the page layout looks good and displays well within a sign. C4DS operators can develop their own pages for capture, or they can engage Deviceworx Sales (sales@deviceworx.com) for custom pages.

Captured pages commonly expose information that is displayed on screens for viewer interest. This is a common technique employed by signage operators and retailers to gain viewer attention and increase screen views.

6.4.1 Deviceworx News and Weather Captures

Currently Deviceworx hosts pages that support local weather and news and a weather forecast. The web address of these pages stipulate for which city, data is shown.

Below is a capture of the local weather and news page for Vancouver, BC, Canada.

Figure 33 - Vancouver Weather and News

This page can be accessed at the following URL:

http://caps.deviceworx.com/newsweather/?woeid=6173331

Below is a capture of the 3 Day Weather Forecast page for Vancouver, BC, Canada.

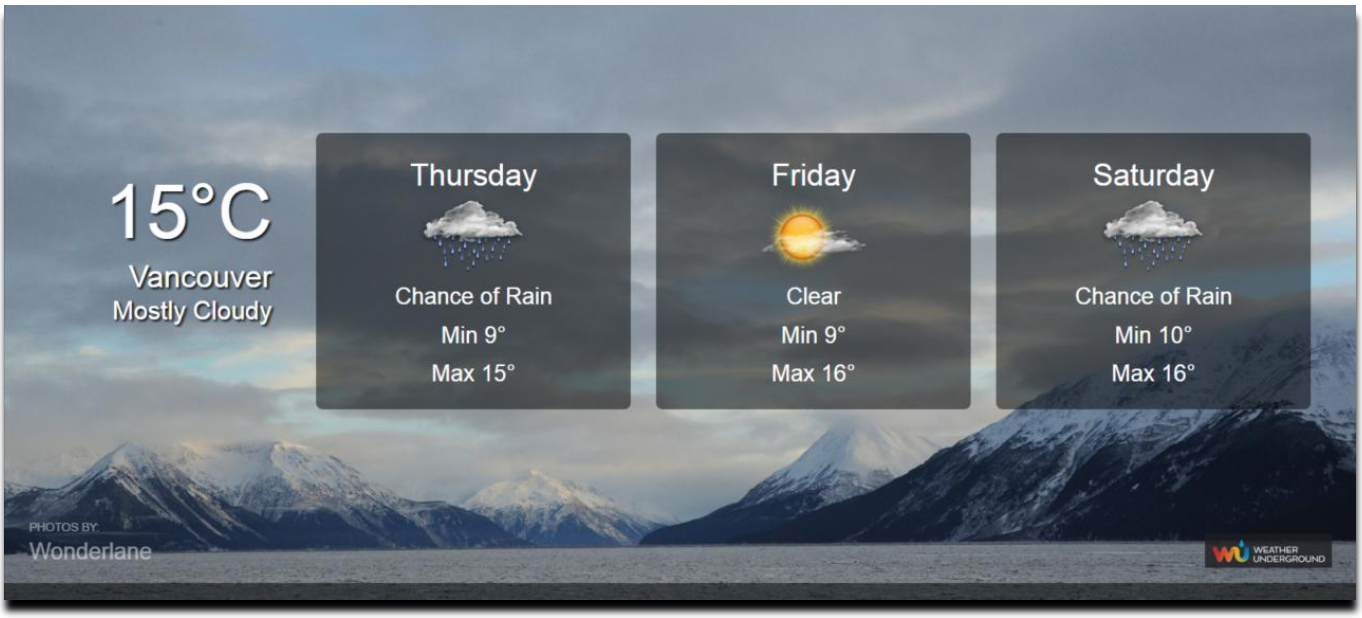


Figure 34 - Vancouver Weather Forecast

This page can be accessed at the following URL:

http://caps.deviceworx.com/3dayforecast/?woeid=6173331

Deviceworx customers can use these pages to show their own news and weather forecast by simply substituting the Where On Earth ID (woeid) for their area within the URL.

To look up an ID for San Jose, California (for example), go to: https://openweathermap.org/find?q= and enter "San Jose, US". The weather info for this location is listed. Select it. Note the url: https://openweathermap.org/city/5392171 ... this shows you the San Jose ID is "5392171". For cities in Canada, use CA. For cities in Aus, use AU. To see the 3 day forecast for San Jose, US use url: http://caps.deviceworx.com/3dayforecast/?woeid=5392171

Note that portrait view for both weather & news or 3-day captures (instead of the default landscape) is available with:

http://caps.deviceworx.com/3dayforecast-p/?woeid=6173331

http://caps.deviceworx.com/newsweather-p/?woeid=6173331

(note the addition of "-p" in the urls).

To see degrees F instead of degrees C, append "&unit=f" to the url. For the San Jose example above, use:

http://caps.deviceworx.com/3dayforecast/?woeid=5392171&unit=f

If you have any difficulty finding a URL for your capture, email Deviceworx Customer Support (support@deviceworx.com) with a location name and we will provide you with URLs that support display of weather and news for your location (e.g. town, city, province, state, country).

6.4.2 Custom Captures

In addition to news and weather, pages can be developed to support a variety of information. Some examples are:

- Local sports scores.
- Current stock quotes.
- Local flight arrival or departure times.
- Customer-specific Information for in-store notifications or hospitality applications.
    - Local stock levels.
    - Employee notifications.
    - Meeting room schedules
    - e.t.c.

Contact Deviceworx Sales (sales@deviceworx.com) if you need us to develop and host capture pages for you.

6.4.3 Capture Technical Details

A Standard C4DS license supports capture of a single web page for each customer. This limit can be extended by Deviceworx Sales (sales@deviceworx.com) on a per-customer basis. Contact Deviceworx Sales as required to increase supported page captures to an unlimited maximum. Note that a per page capture fee applies if increasing beyond the single page capture supported by a standard license.

Page captures occur every 5 minutes. They are acquired by the Deviceworx server. Players fetch captured pages from the Deviceworx server immediately before their display (when the preceding ad within a campaign is shown). Because captures are queued up within the Deviceworx server, expect a maximum delay of approximately 5 minutes before they are shown on any player screen.

If customers wish to display web page captures from their own internal network and access to these captures requires network credentials, contact Deviceworx Customer Support (support@deviceworx.com) with credentials for access. Note that a one-time engineering fee may apply for setup of credentialed access.

6.4.4 Adding a Page Capture

To add a remote web page capture, ensure that the ad list is visible within the Ad Manager. Select "Add". Instead of selecting a local file, select the "Remote Web Page ..." tab within the form. Enter a valid web page "URL" and "Ad Name". The web page can be previewed by selecting "Preview". Allow up to 10 seconds for rendering a page. Previewing is a good idea as a means of confirming that the provided "URL" is accurate. An example page capture form is shown below.

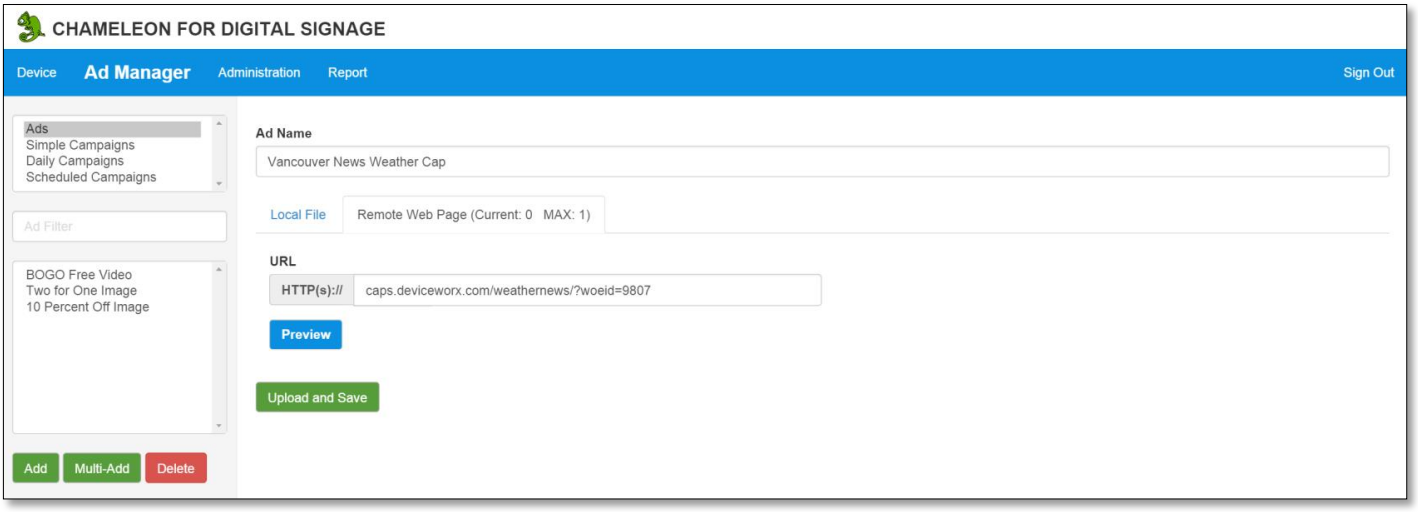


Figure 35 - Setup Remote Page Capture

When all capture details are set, select "Upload and Save" to store the capture configuration. The ad list will then include the web page capture as a selectable item as shown below.

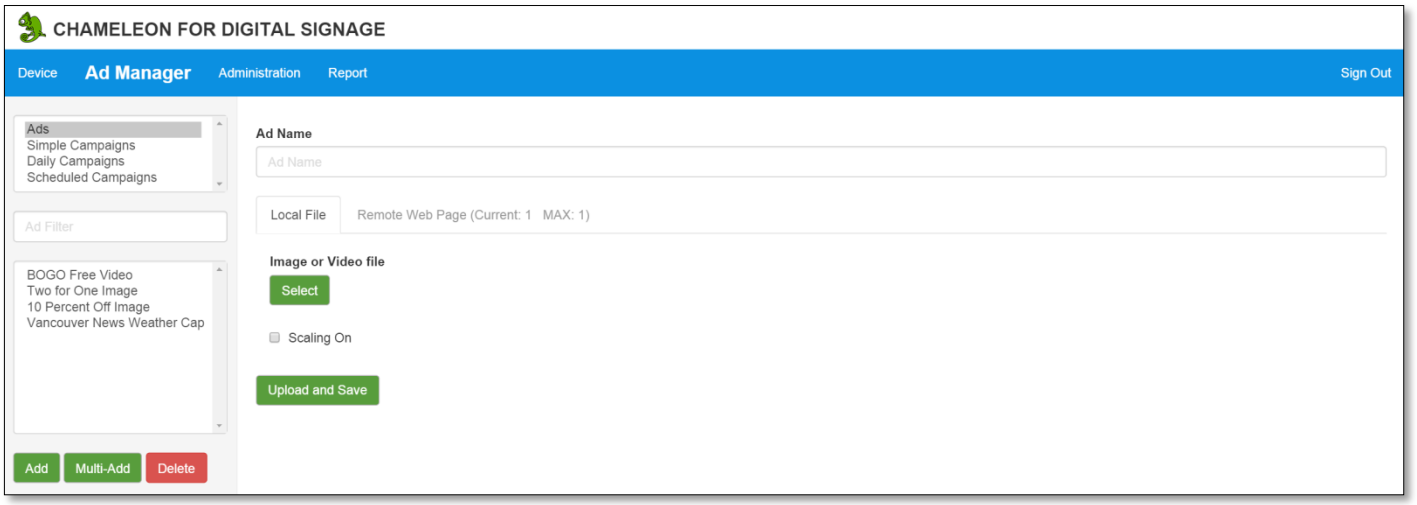


Figure 36 - Ad List with Captures Used Up

Note that in the figure above the "Remote Web Page ..." tab now includes the text "Count: 1 Max: 1)". This signifies that the customer account no longer has any available remote web page captures. See 6.4.3 - Capture Technical Details for information on support for more captures. To re-enable access to the Remote Web Page selection tab, delete the current web page capture item by selecting it within the ad list and then selecting "Delete".

6.5 Campaign Overview

Campaigns are simply lists of ads or other content to be played along with other playback details including how long static ads play, transition animations to run between ads, playback order, etc.

After ads have been added to the dashboard, these ads can be included within campaigns. These campaigns are then selected for playback within player devices. Note that ads are not directly selectable for playback and must be included within at least one campaign.

There are 3 types of campaigns supporting different levels of scheduling capability and complexity. Simple Campaigns are just a collection of ads along with data describing how those ads are played. Daily Campaigns are a collection of Simple Campaigns along with when (during each day) these campaigns are to play. Scheduled Campaigns may be a collection of Simple Campaigns along with when (date and time on a calendar) each of these campaigns play. Scheduled Campaigns may also be a collection of Daily Campaigns along with when (date on a calendar) each of these Daily Campaigns play. Each campaign type is described in detail within sections that follow. For simple playback of a collection of ads or other content, users should reference 6.6 - Simple Campaigns.

Note that C4DS does not limit either the number of ads or the number of campaigns configured by users. The only limit imposed by the C4DS Dashboard is the number of remote web page capture ads.

6.6 Simple Campaigns

Simple Campaigns are a collection or list of ads and metadata describing how those ads are played. Before Simple Campaigns can be setup, you must first add the content files to the dashboard as described within sections 6.2 (graphic and video file ads) and 6.4.4 (web page capture ads). Select "Simple Campaigns" within the "Ad Manager" tab. The figure below shows the resulting form when no Simple Campaigns exist within the dashboard.

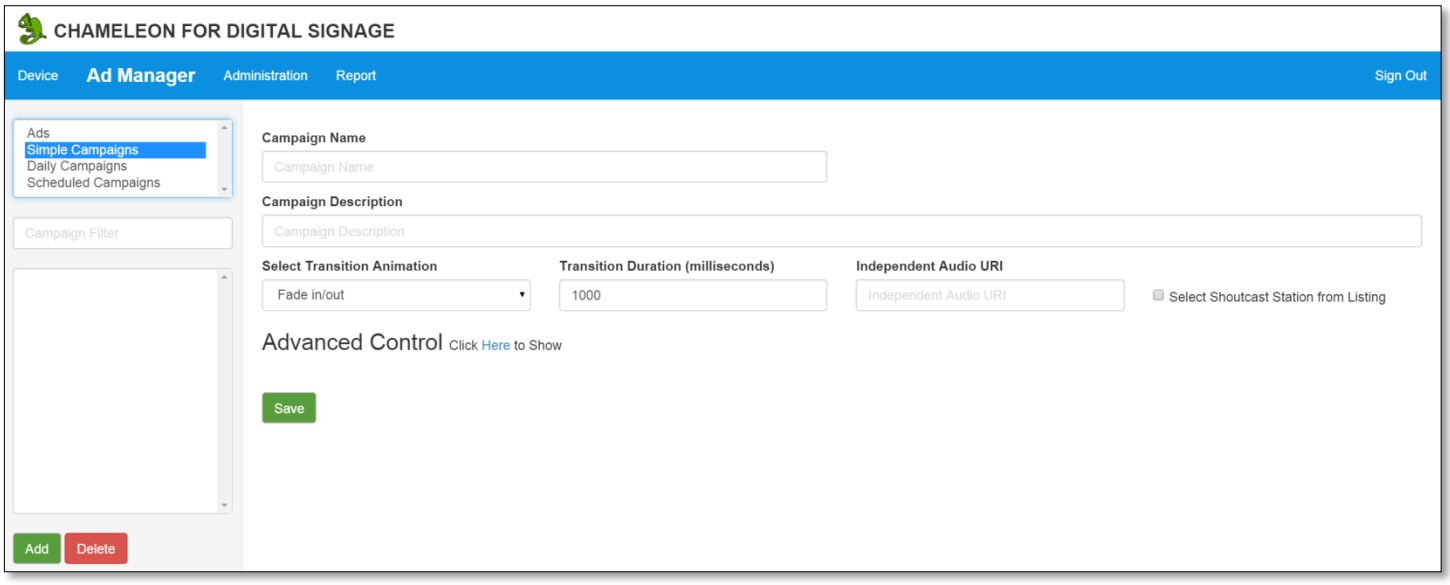


Figure 37 - Empty Simple Campaign

Provide a short "Campaign Name" and a "Campaign Description". All dashboard references to the Simple Campaign will use the "Campaign Name". The "Campaign Description" field is provided to enter more detail on the campaign for later reference (visible within this form only).

Users must specify a campaign name and description before selecting ads or other content. Selecting "Save" after entering a name and description will extend the form to show available ads that can be added to the campaign as shown below.

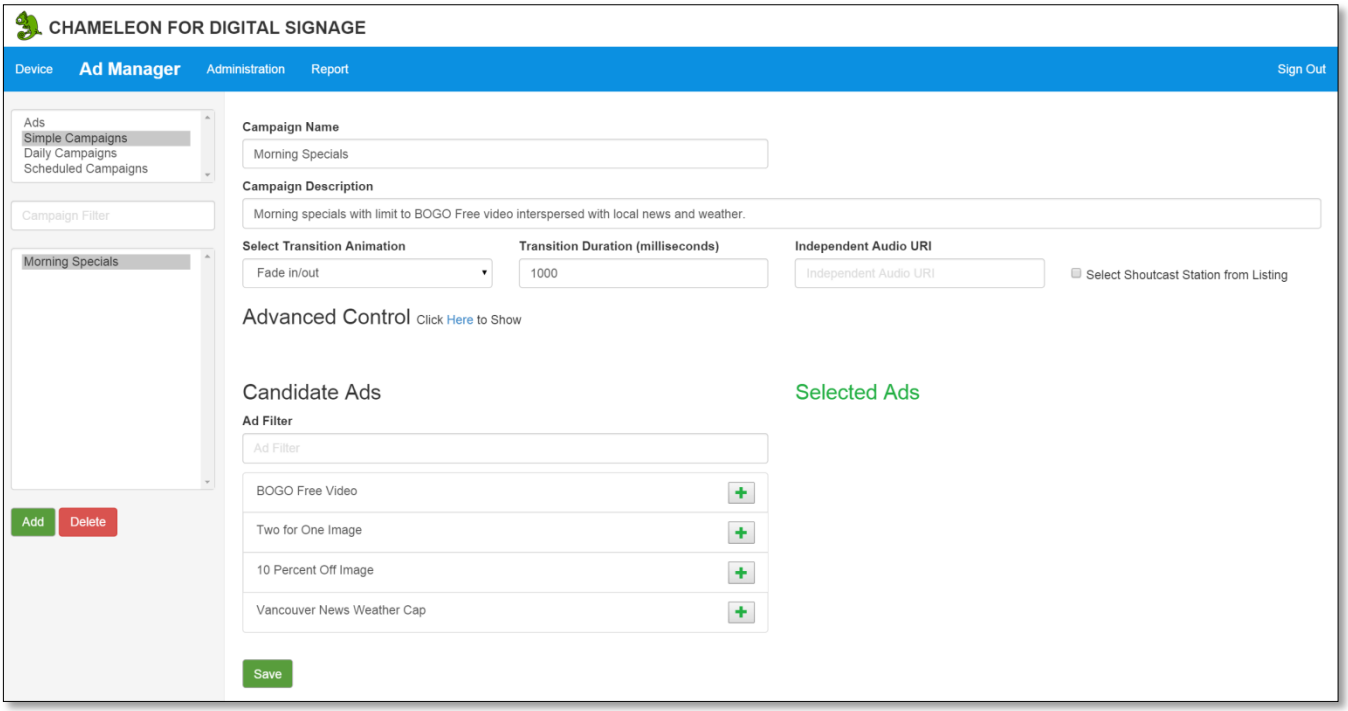


Figure 38 - Simple Campaign Ad Selection

Drag ads from the "Candidate Ads" list to the "Selected Ads" list as required to add them to the campaign. Alternately, select + next to the selected ad to add into the campaign.

Once ads have been added to "Selected Ads", alter their order by dragging them up and down within the list.

To play any ad multiple times within the campaign, simply add it multiple times to the "Selected Ads" list and arrange it to the desired sequence order.

The play time for each ad is shown within each ad entry in the "Selected Ads" list (default 10 seconds). Alter this play time by selecting ✎, changing the value displayed and then selecting ✓. These elements are shown within the figure below.

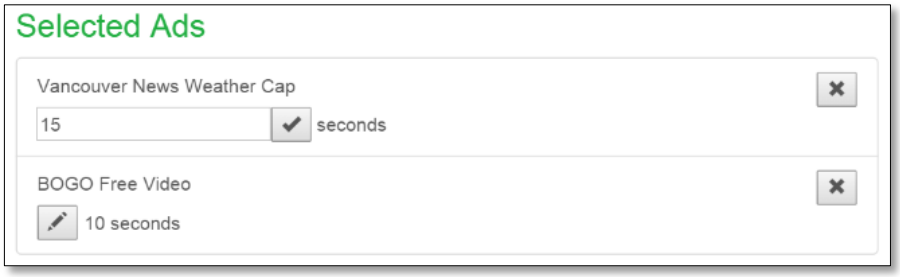


Figure 39 - Edit Graphic and Capture Play Times

Note that video play time specified within the list is ignored during playback as the video itself has an inherent play time.

The figure below shows a Simple Campaign including only 2 ads selected from the list of 4 candidate ads.

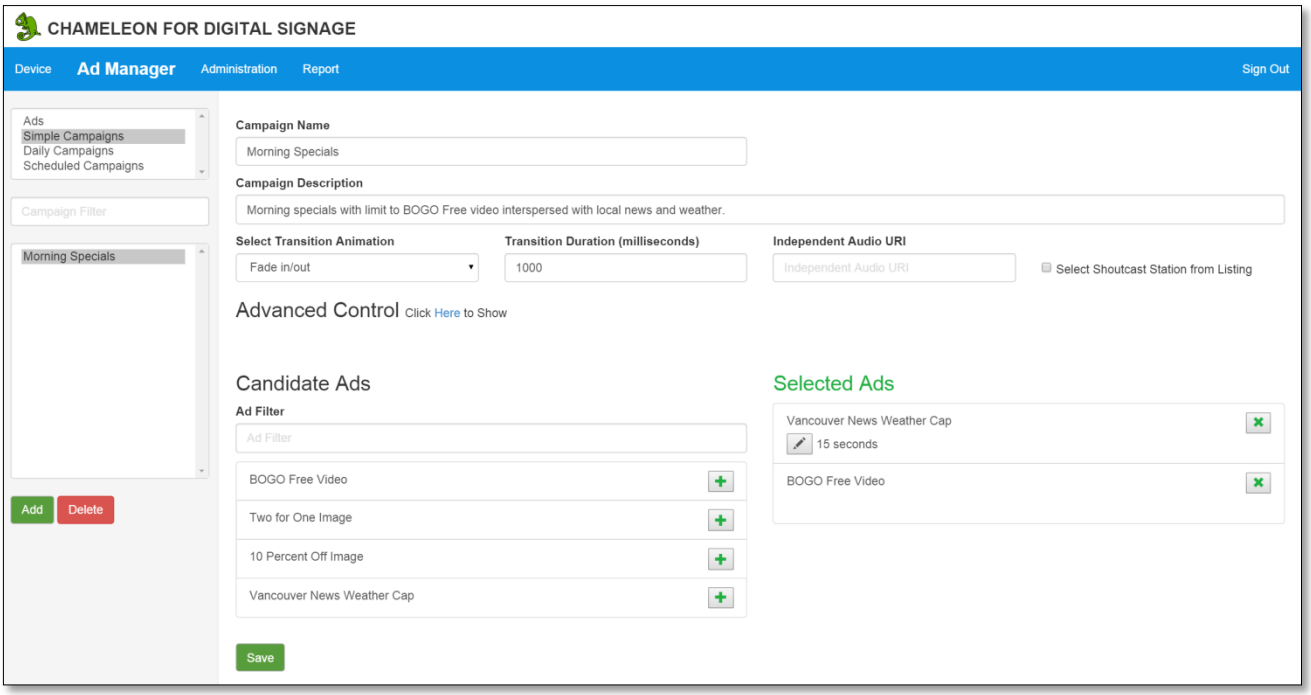


Figure 40 - Simple Campaign with Ads

To delete any ad from the "Selected Ads" list, select .

Note that Deviceworx recommends an ad playback time that is at least 10 seconds for optimal viewer retention.

6.6.1 Animations

By default, campaigns will support a fade in and out between static graphic ads or web page capture ads with a fade in and out duration of 1 second (1000 milliseconds). Users may change the animation time or the animation type. The following types are supported.

- Fade In/Out. The currently shown graphic fades or dissolves out of view (to black) and then a new graphic fades or dissolves in.
- Zoom In/Out. The currently shown graphic shrinks until out of view (on black background) and then a new graphic grows into it full size from out of view.
- Slide In/Out. The visible graphic slides out from view (left to right) on a black background and then a new graphic slides into view (left to right).

Experimenting with the different animations and animation times is the best way to appreciate their differences.

6.6.2 Independent Audio

Many operators and retailers can benefit from audio playback during the display of silent ads (graphic files, web page captures or even videos without audio content). C4DS supports high fidelity audio playback that is independent of what is on screen for additional advertising or for ambient background music.

To stream independent audio, enter a URI within the campaign. Only URIs to MP3 streams are supported.

For simple entry of URIs supporting ambient background music, the C4DS dashboard includes categorized selection from over 20,000 internet radio stations that are hosted by Shoutcast. To choose a Shoutcast station, enable the "Select Shoutcast Station from Listing" checkbox as shown below.

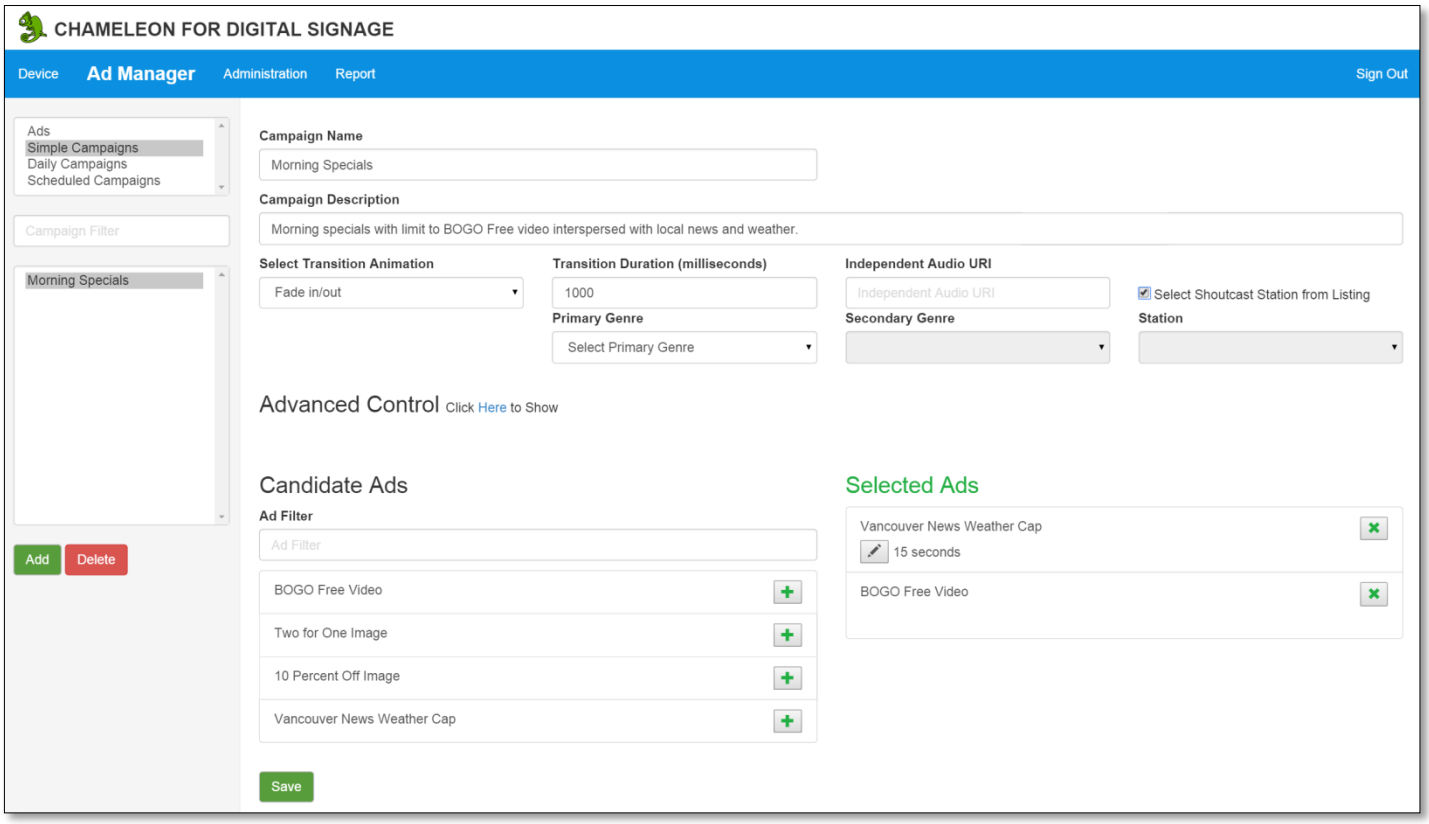


Figure 41 - Shoutcast Station Selection Enable

Select one of the available primary genres and a corresponding list of secondary genres will be shown. Select a secondary genre and a list of stations within that secondary genre will be shown. Select a station and then the "Independent Audio URI" will be populated with the URI to the selected station as shown below.

To enter a URI explicitly, ensure that the "Select Shoutcast Station from Listing" checkbox is unchecked.

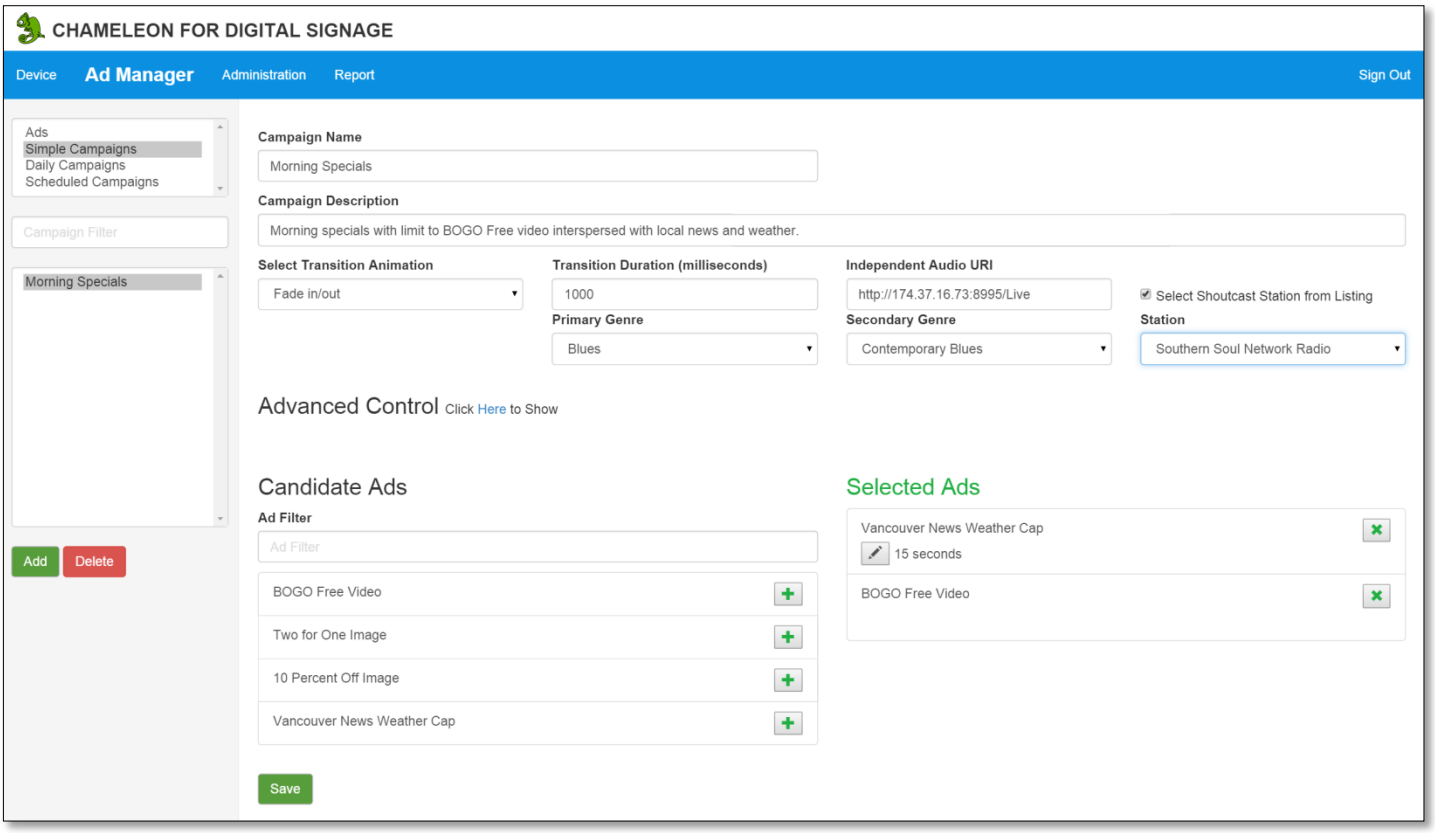


Figure 42 - Shoutcast Station URI Set

Whenever the campaign plays, the selected radio station ("Southern Soul Network Radio" in the example above) will be played.

C4DS customers wishing to play audio advertisements during campaigns, can contact Deviceworx Sales (sales@deviceworx.com). Deviceworx can be commissioned to setup a Shoutcast station for customers to handle playback of customer-specific audio ads. Customer devices can then reference their own station URI. Note that engineering fees will apply.

Important notes for independent audio:

- Independent audio and audio that is part of a playing video will be mixed. Viewers will hear both audio tracks at the same time. For this reason, do not enable independent audio within any campaign that includes a video with sound.
- Streaming of independent audio through C4DS will require 5+ seconds of buffering. Audio playback will not be immediate after a campaign starts.
- Graphic support within C4DS is optional. If users decide, they can use a C4DS player simply as an internet radio streaming platform. Advantages to using a C4DS player exclusively for audio playback (compared to pure internet radio players) are:
    - Remote control. Central administrators (not local staff) can control which stations are played to better control audio within their business environments.
    - Scheduling support. Operators and retailers can schedule campaigns (discussed in sections that follow) and can therefore schedule which streams will play in the future and at which times.
- When no graphic, web page captures or video ads are selected within a playing campaign, the C4DS player will display a status screen indicating "Audio Playback Only" as shown below.

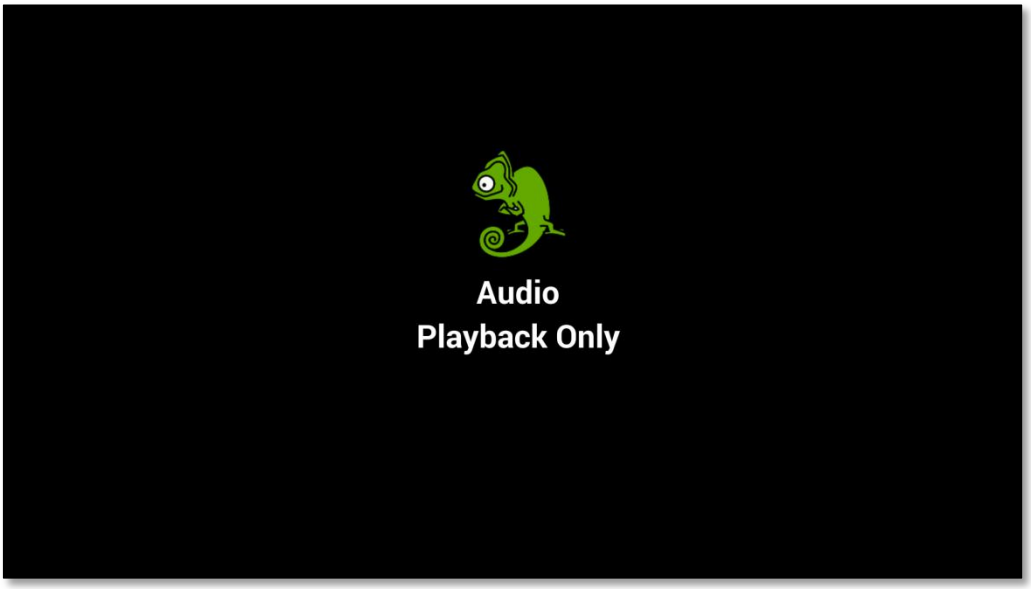


Figure 43 - Screen Displayed During Audio Playback Only

6.6.3 Campaign Beacons

A section within Simple Campaigns supports entry of Beacon IDs. Note that this functionality is only supported by Deviceworx industrial-grade xPLAYERs and not standard set-top box players like the xrs 4500. Contact Deviceworx Sales (sales@deviceworx.com) for details on this player or to get Beacon proximity messaging support from battery operated xTAG BEACON devices.

6.7 Daily Campaigns

Daily Campaigns support a simple way of scheduling Simple Campaigns to run at specific times of the day. To setup a Daily Campaign, users must first create at least 2 Simple Campaigns. See 6.6 - Simple Campaigns for details on Simple Campaigns, including how to create them. Next, users simply create a Daily Campaign and stipulate at what time of day (in hours and minutes past midnight local time) each of the Simple Campaigns should play.

To create a Daily Campaign, select "Daily Campaigns" within the "Ad Manager" tab. The figure below shows the resulting form when no Daily Campaigns exist within the dashboard.

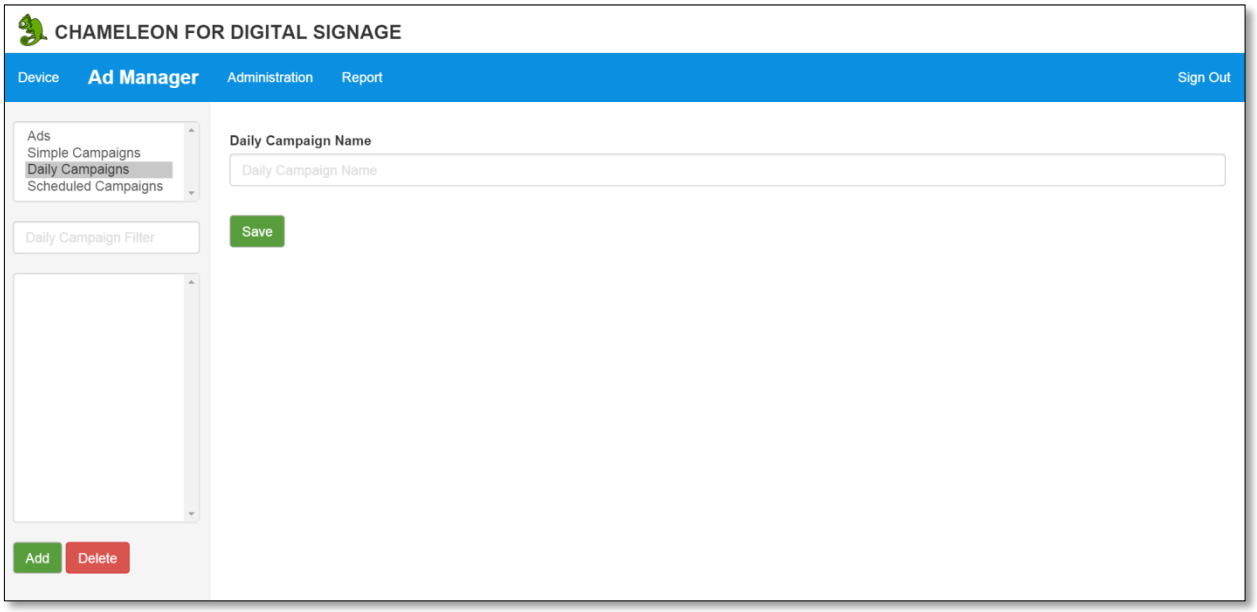


Figure 44 - Empty Daily Campaign

Enter a "Daily Campaign Name" and select "Save". Available Simple Campaigns are listed within the resulting form below.

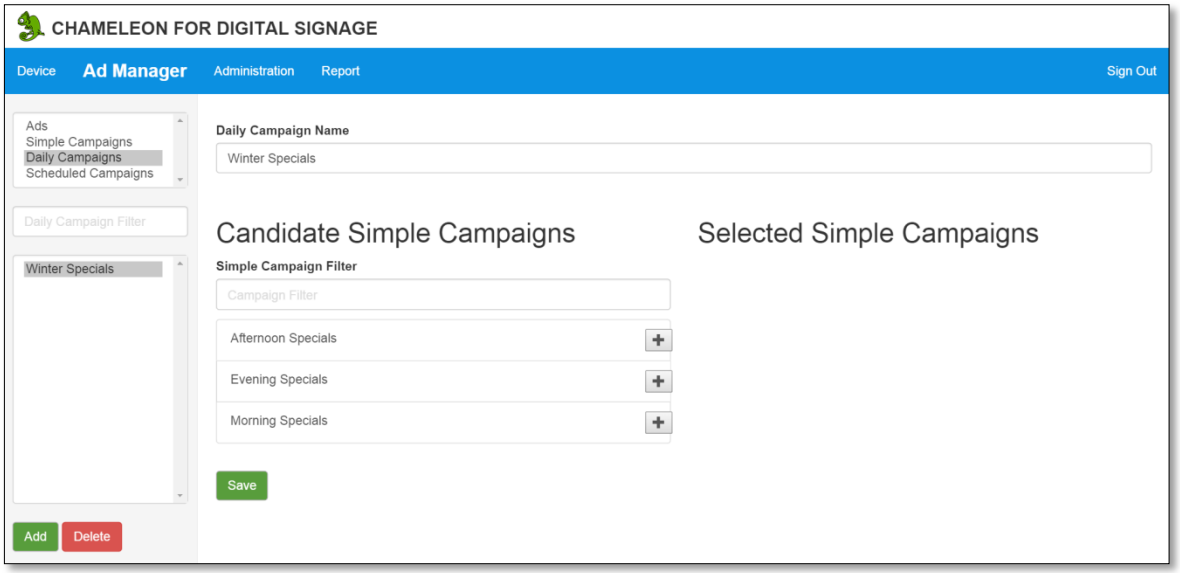


Figure 45 - Daily Campaign with Selectable Campaigns

Add any Simple Campaigns that are to be scheduled using [+]. By default, the selected play time for newly added campaigns will be 00:00 or midnight local device time. Select the calendar icon ( ) to open a time picker control as shown below.

Figure 46 - Daily Campaign Time Picker

Select the local device start time for selected Simple Campaigns. The figure below shows a Daily Campaign that includes 3 Simple Campaigns.

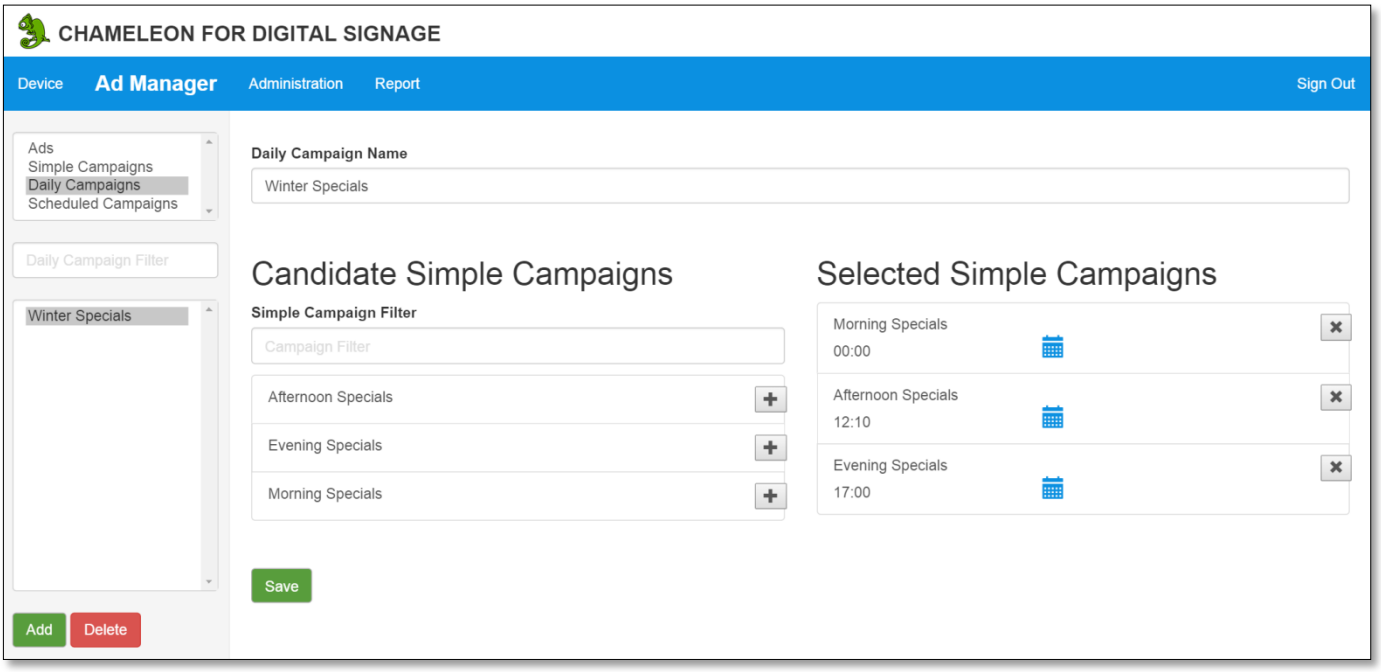


Figure 47 - Daily Campaign Example

In the "Winter Specials" campaign shown above, the "Morning Specials" campaign will run every day from midnight until 12:10 PM. Then, the "Afternoon Specials" campaign will run until 5:00 PM (17:00). After 5PM and until midnight, the "Evening Specials" campaign will run. This is shown on the timeline that follows.

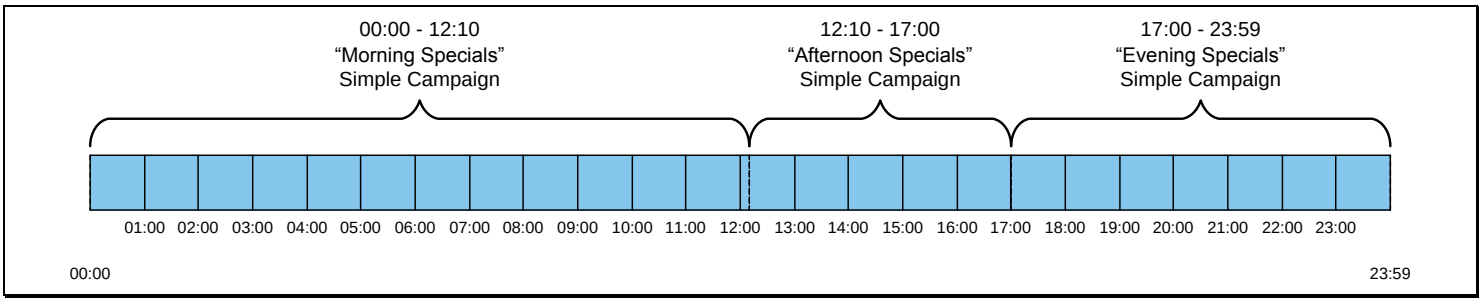


Figure 48 - Example Daily Campaign Timeline

Notes for Daily Campaigns:

- Local device time is always used to select Simple Campaigns that are defined within a Daily Campaign.
- The first Simple Campaign is selected if the current local device time does not stipulate that any other Simple Campaign should be played.
- Any Simple Campaign can be selected multiple times within a Daily Campaign.
- Unlimited Daily Campaigns may be created and each can contain an unlimited number of Simple Campaigns.

6.8 Scheduled Simple Campaigns

Scheduled Simple Campaigns are a collection of Simple Campaigns, each with a start date and time. To setup a Scheduled Simple Campaign, users must first create at least 2 Simple Campaigns. See 6.6 - Simple Campaigns for details on Simple Campaigns, including how to create them.

To create a Scheduled Simple Campaign, select "Scheduled Campaigns" within "Ad Manager" tab and then select a "Scheduled Campaign Type" of "Simple Campaign". The figure below shows the resulting form when no Scheduled Simple Campaigns exist within the dashboard.

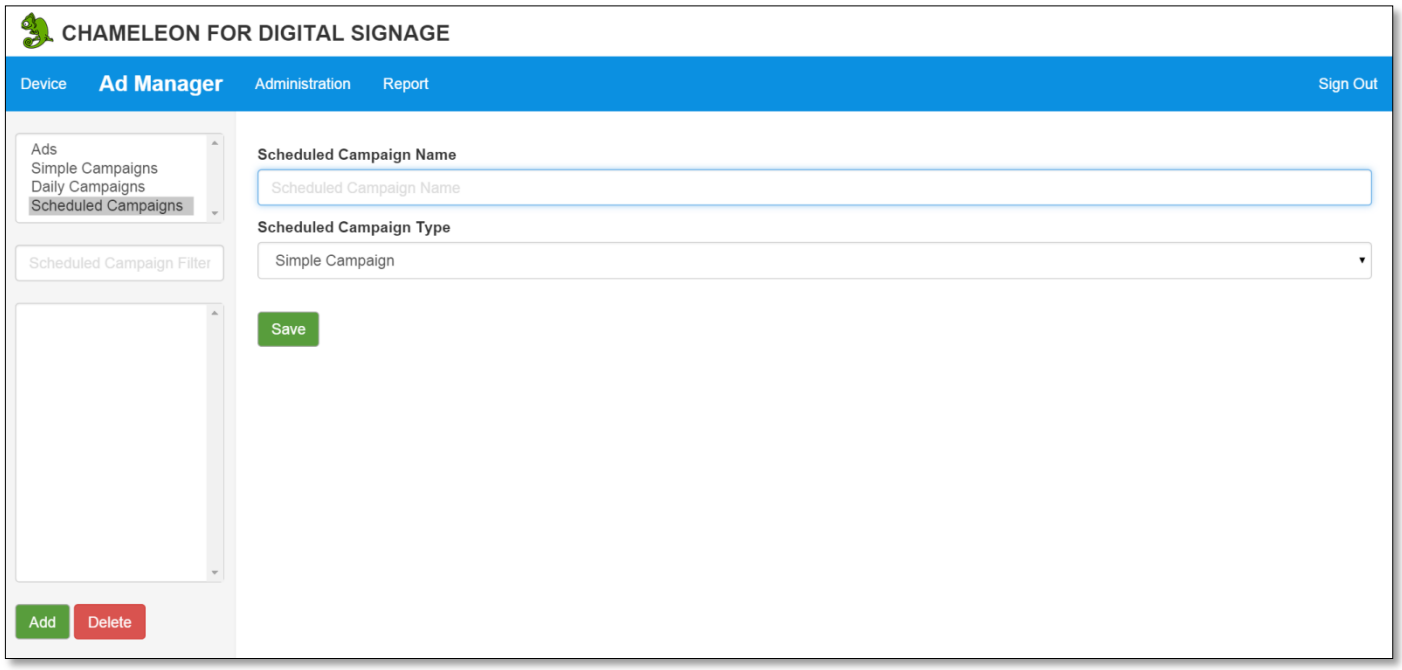


Figure 49 - Empty Scheduled Campaign

Enter a "Scheduled Campaign Name" and then select "Save". Available Simple Campaigns will be shown and selectable for inclusion within the Scheduled Simple Campaign as shown below.

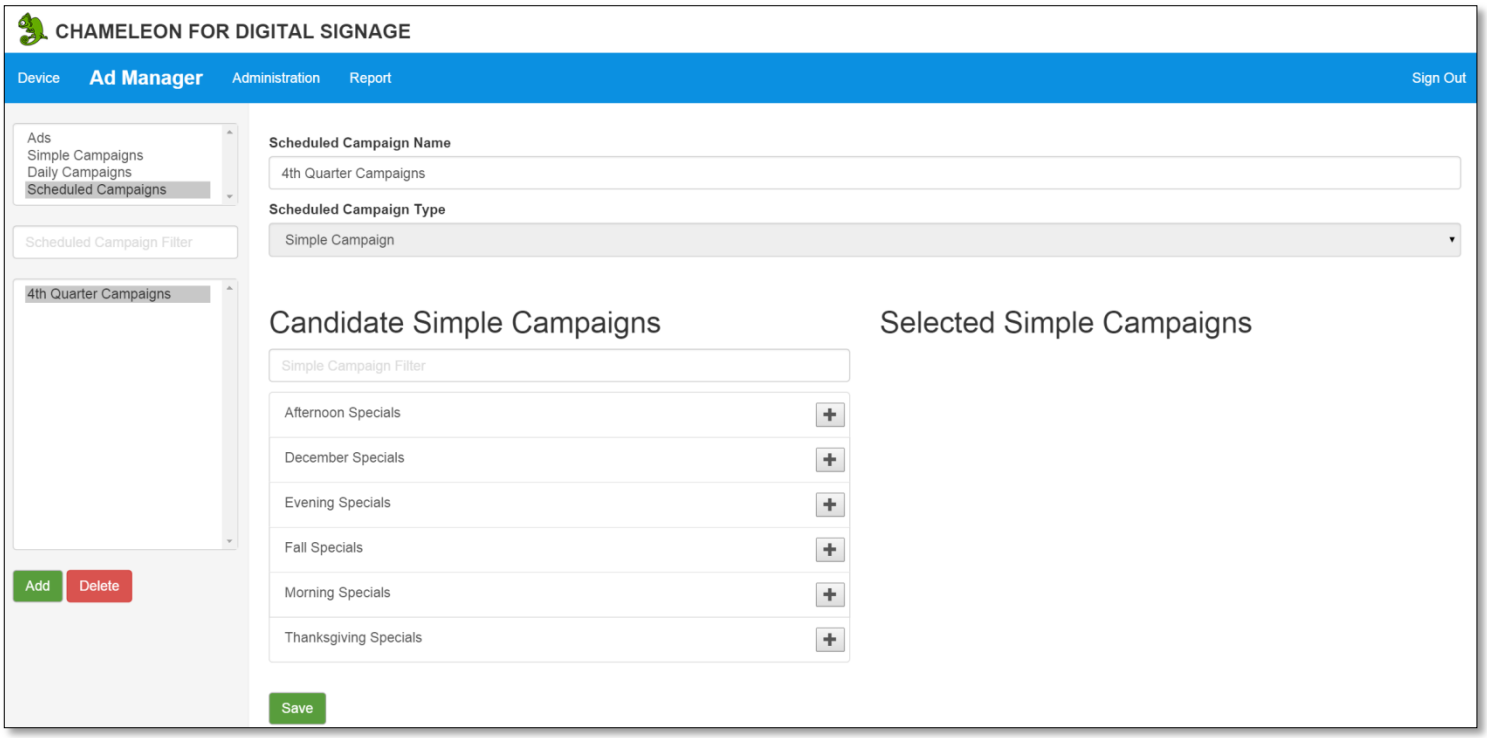


Figure 50 - Scheduled Simple Campaign Collection with Selectable Campaigns

Add any Simple Campaigns that are to be scheduled using + . By default, the selected start time for newly added campaigns will be the current time. Select the calendar icon ( ) to open a date and time picker control as shown below.

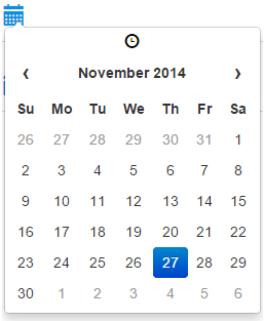


Figure 51 - Scheduled Campaign Date and Time Picker (Date Showing)

Select a date and then the icon at the top of this picker to access time selection as shown below.

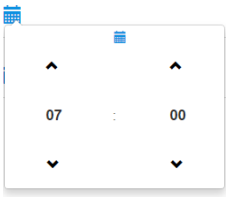


Figure 52 - Scheduled Campaign Date and Time Picker (Time Showing)

Switch between date and time selection by selecting the small or icon at the top (middle) of the picker.

The example Scheduled Simple Campaigns collection below includes the scheduling of 3 Simple Campaigns.

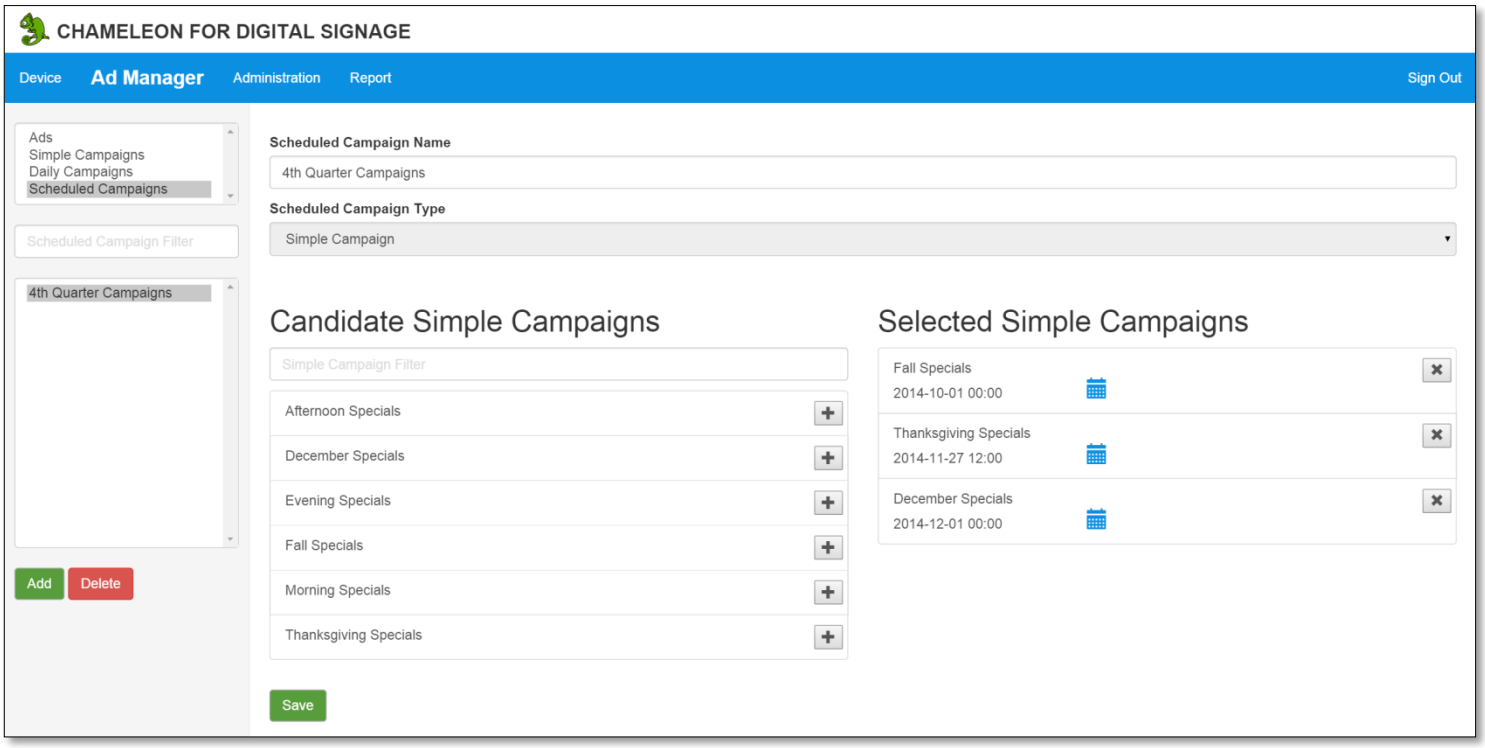


Figure 53 - Scheduled Simple Campaign Example

In this example, the "Fall Specials" campaign will start immediately and play until November 27 at 12:00 PM (noon local device time). At this time, the "Thanksgiving Specials" campaign will play and continue playing until midnight on December 1 when the "December Specials" will start playing.

Notes for Scheduled Campaigns:

- Local device time is always used to select Simple Campaign start times.
- The first Simple Campaign is selected if the current local device date and time does not stipulate that any other Simple Campaign should be played. For clarity, select a start date and time that is in the past for the first campaign.
- Any Simple Campaign can be selected multiple times.
- Unlimited Scheduled Campaigns may be created and each can contain an unlimited number of Simple Campaigns.

6.9 Scheduled Daily Campaigns

Scheduled Daily Campaigns are simply a collection of Daily Campaigns, each with a start date. To setup a Scheduled Daily Campaign, users must first create at least 2 Daily Campaigns. See 6.7 for details on Daily Campaigns, including how to create them.

To create a Scheduled Daily Campaign, select "Scheduled Campaigns" within "Ad Manager" tab and then select a "Scheduled Campaign Type" of "Daily Campaign". Figure 49 above shows the resulting form when no Scheduled Daily Campaigns exist within the dashboard.

Enter a "Scheduled Campaign Name" and then select "Save". "Candidate Daily Campaigns" will be shown and selectable for inclusion within the Scheduled Daily Campaign as below.

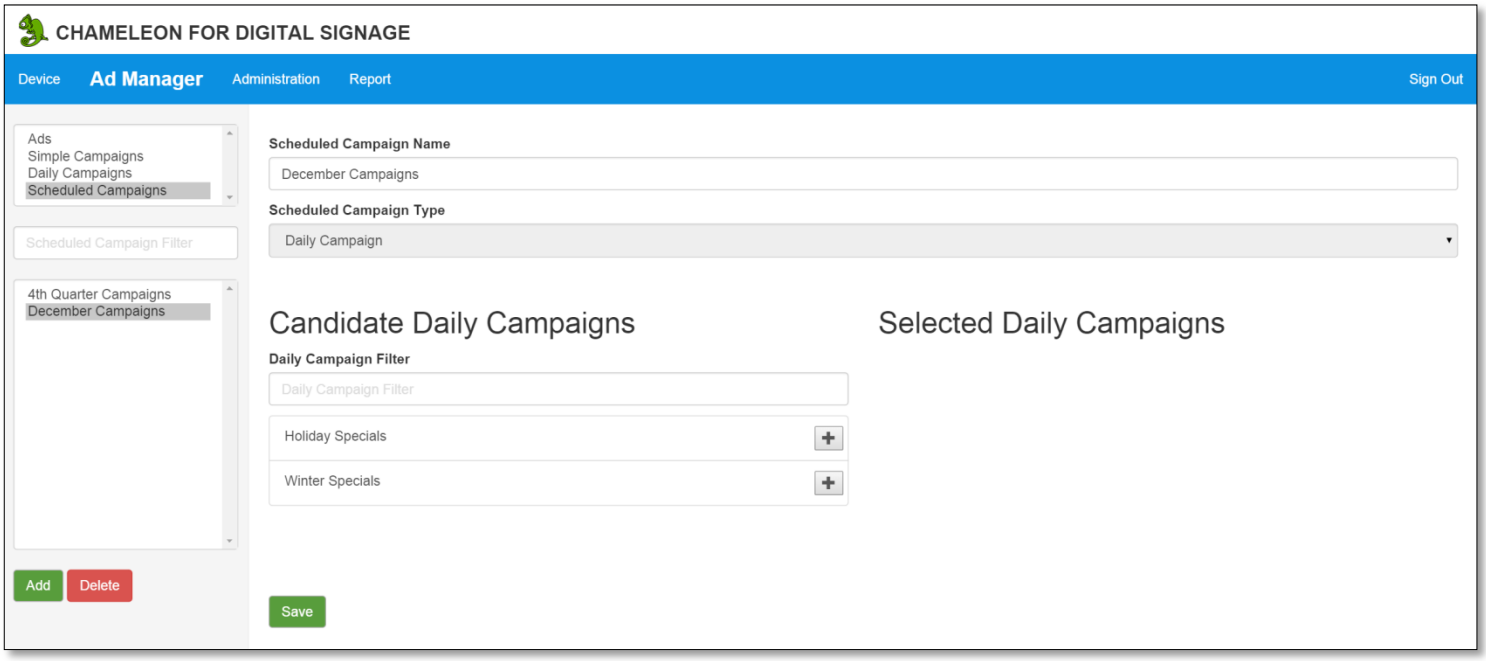


Figure 54 - Empty Scheduled Daily Campaign

Add any Daily Campaigns that are to be scheduled using + . By default, the selected start date for newly added campaigns will be the current date. Select the calendar icon ( ) to open a date picker control as shown below.

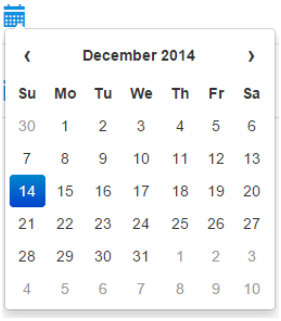


Figure 55 - Scheduled Campaign Date Picker

Alter "Selected Daily Campaign" start dates using the date picker with each.

The example Scheduled Daily Campaign below includes the scheduling of 3 Daily Campaigns.

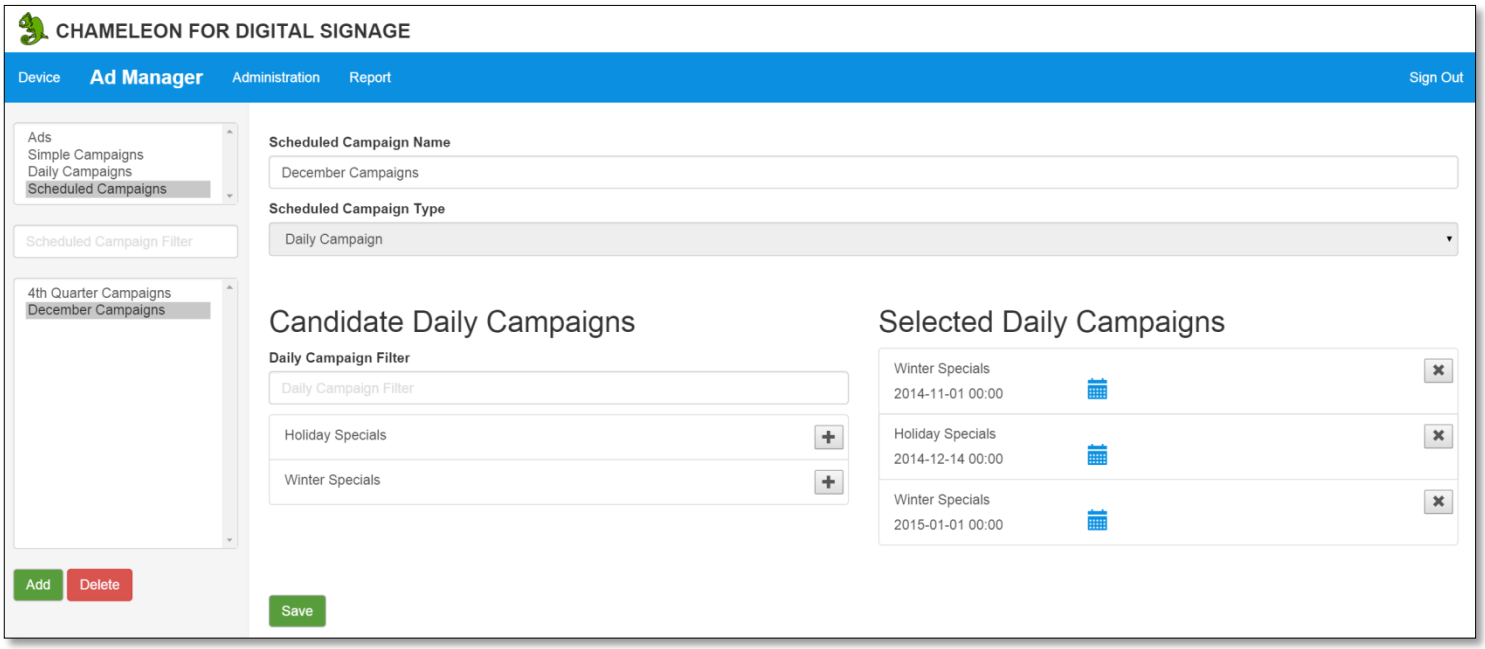


Figure 56 - Scheduled Daily Campaign Example

In the example above, a "Winter Specials" Daily Campaign will start playing first. On December 14, 2014 (at midnight local device time), the "Holiday Specials" Daily Campaign will begin playing and will continue to play until January 1, 2015. At that time the "Winter Specials" campaign will resume play again.

The timelines below detail the scheduling outlined within the example above.

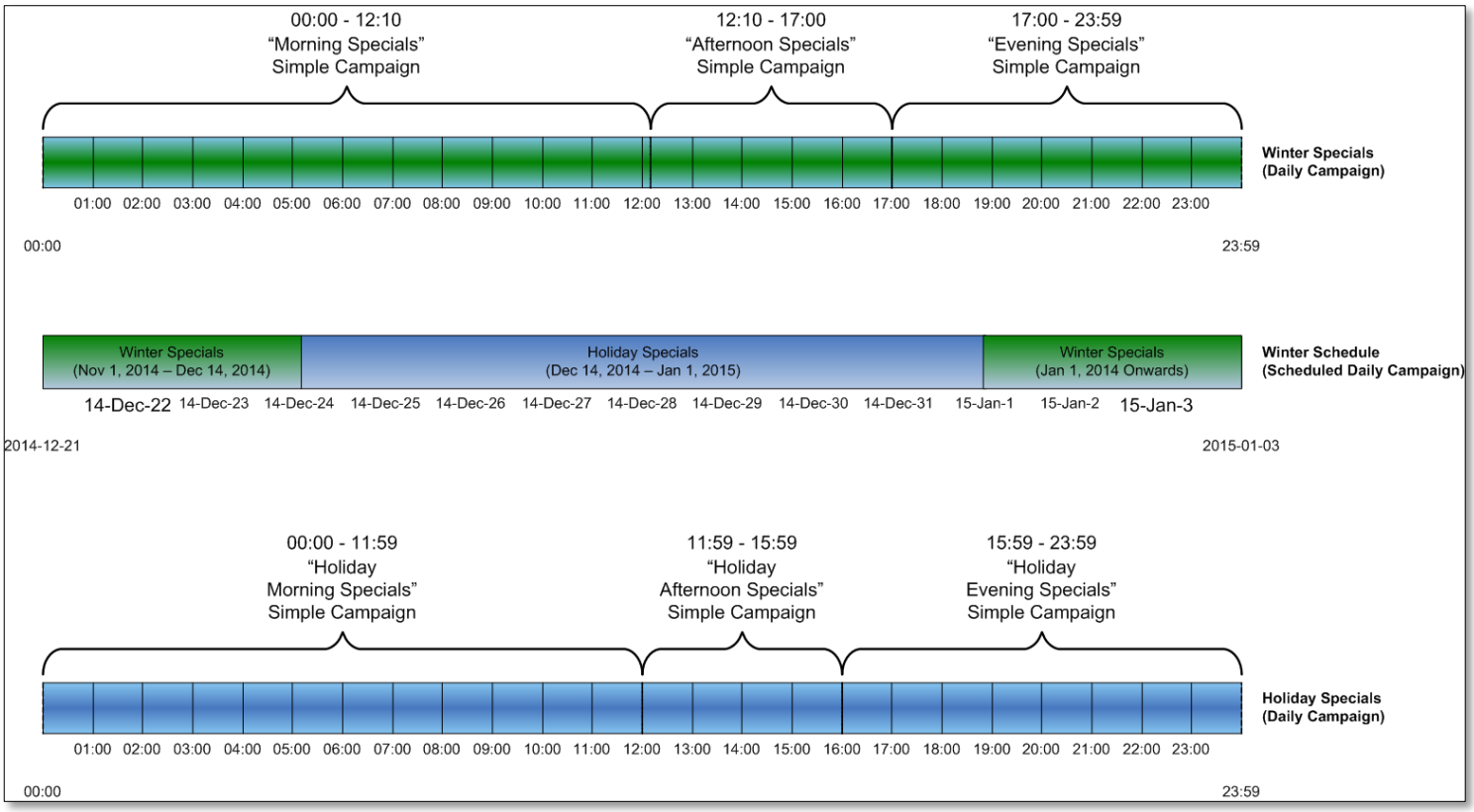


Figure 57 - Scheduled Daily Campaign Timelines

Notes for Scheduled Campaigns:

- Local device time is always used to select Daily Campaign and included Simple Campaign start times.
- The first Daily Campaign is selected if the current local device date does not stipulate that any other Daily Campaign should be played. For clarity, select a start date that is in the past for the first Daily Campaign to play.
- Any Daily Campaign can be selected multiple times.
- Unlimited Scheduled Daily Campaigns may be created and each can contain an unlimited number of Daily Campaigns.

6.10 Deleting Ads or Campaigns

Ads cannot be deleted if they are being used within campaigns. Delete campaigns that reference ads before deleting the ads themselves. A pop-up error will be shown if users try to delete an ad that is used within a campaign and the ad will not be deleted.

The figure below shows an example where the pop-up error results.

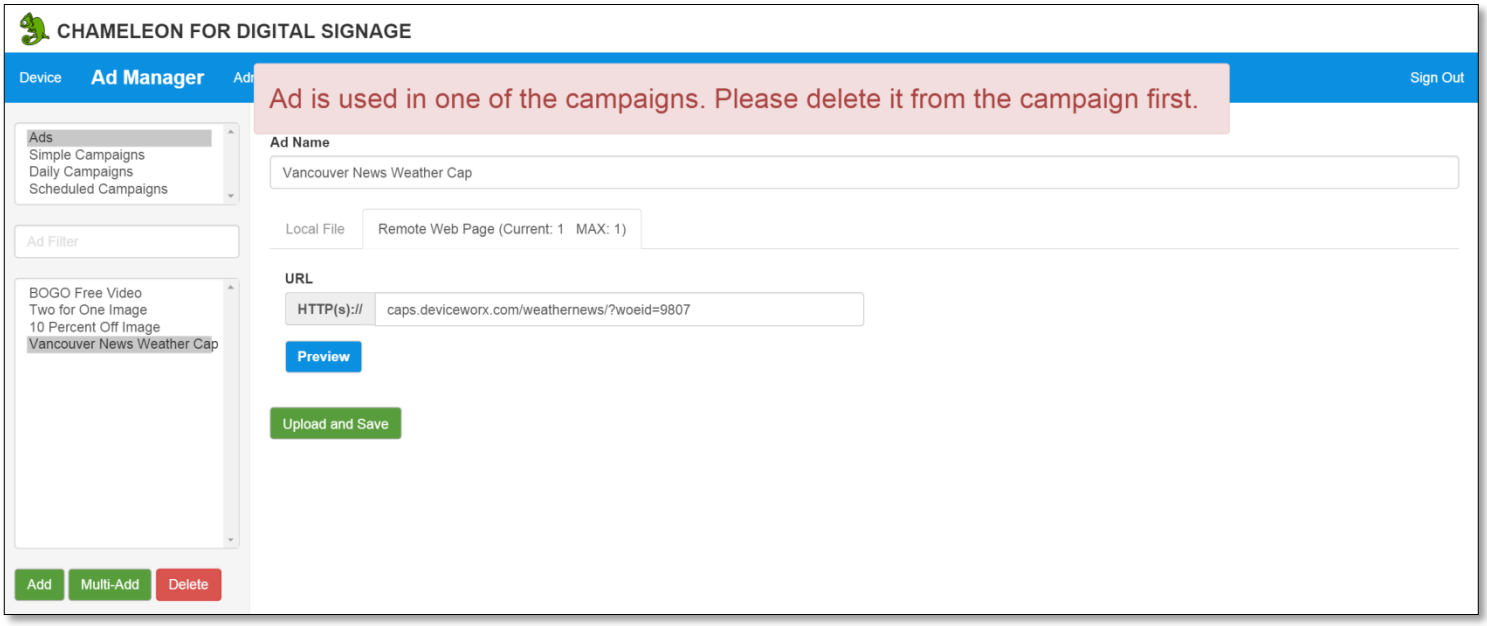


Figure 58 - Error When Deleting Ad with Dependency

In the figure above, the "Vancouver Weather and News ..." ad is referenced within at least one campaign and therefore cannot be deleted.

Like ads, campaigns cannot be deleted if they are being used within another campaign or if the campaign has been selected for device playback. If a campaign is to be deleted, remove references to it from other campaigns and devices. For example, if a Simple Campaign is included within a Daily Campaign, that Simple Campaign must be removed from the Daily Campaign before it can be deleted. Alternately, if possible, simply deleting the Daily Campaign will also remove the Simple Campaign reference and support subsequent Simple Campaign deletion. A pop-up error will be shown if users try to delete a campaign that is used within another Daily Campaign or Scheduled Campaign and the campaign will not be deleted.

7 Dashboard Reports Tab

C4DS supports the display and export of reports that show when ads have played. Reports can be generated for single devices, or a collection of devices within a department, a site, a division or system wide. Importantly, play records within reports are only generated in devices after an ad has actually played and not simply based on ad playback scheduling. For this reason, reports can be used to bill for advertising as "proof of play" reports.

Critically - reports are only visible for the last 6 months of playback due to cloud storage constraints.

To generate a report, select the "Report" tab within the blue dashboard header. Next, select filtering to stipulate which records to include within the report. Filtering supports selection of the report timezone, the timeframe within the selected timezone, which devices to report on and (optionally) how to breakdown report results. After selecting filter values, select "View Report" to see results. An example report for a year is provided below.

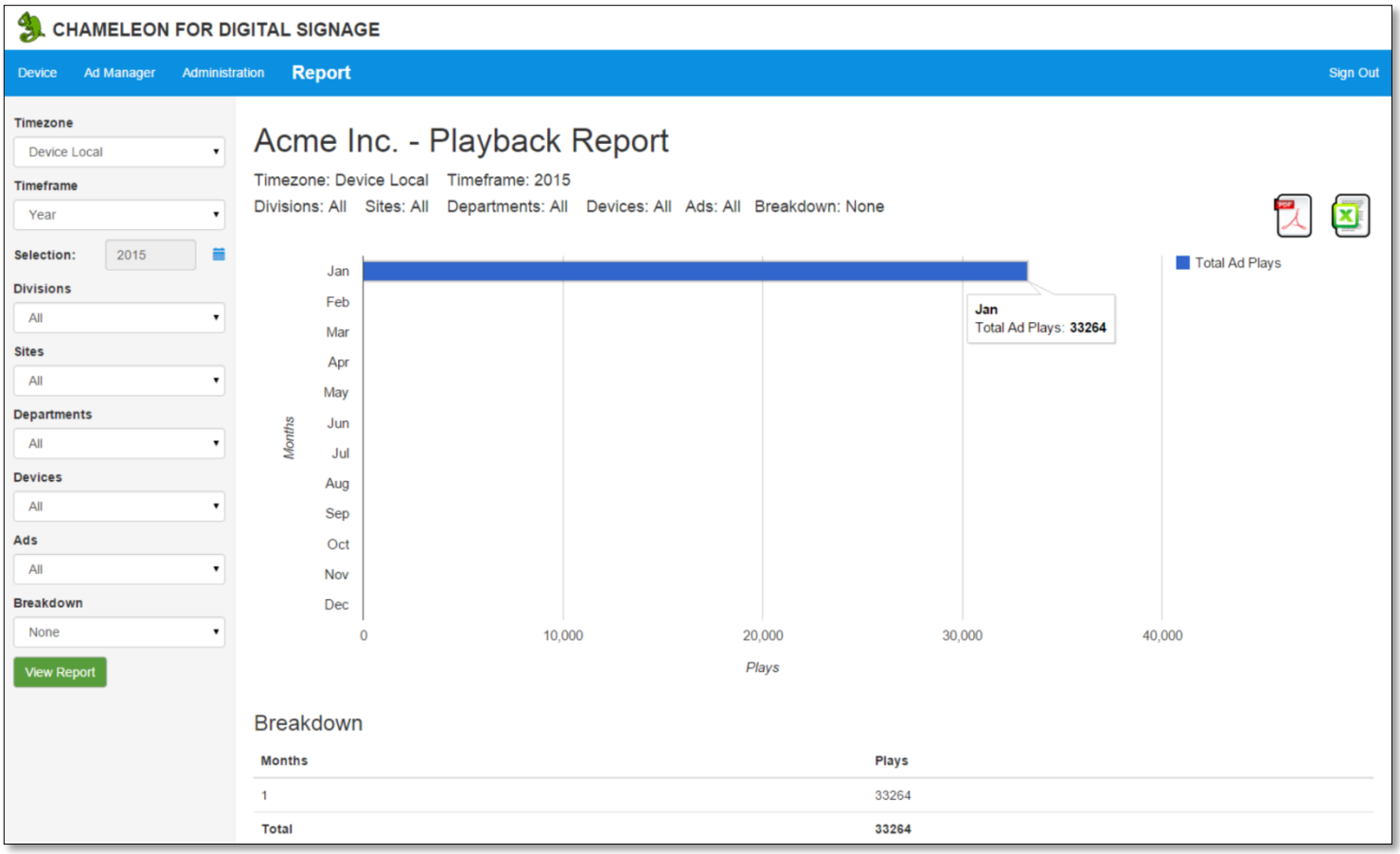


Figure 59 - Example Playback Report for all Devices in a Year

Note that the example above shows a callout window on January 2015 results. This callout appears whenever the mouse pointer is over on the "Jan" bar. Callout details include the "Total Ad Plays:" for the month. Details for all months are shown at the bottom of the report.

After report generation, results may be exported into a PDF file or Microsoft Excel file.

7.1 Report Filtering

Each report filter is detailed below. It is simplest to select filters from the top down.

7.1.1 Timezone

Report results may be generated using 1 of 3 timezones filter values.

- "Device Local" - Play data records are selected within a timeframe that is described by each device's local time.
- "Greenwich Mean Time" - Records are selected within a timeframe that is described by Greenwich Mean Time or GMT.
- "Customer" - Records are selected within a timeframe that is described by the timezone specified for the customer (i.e. head office timezone).

The figure below shows different timeframe boundaries used to select data records for a report when the timezone filter assumes each of the filter values above for the same timeframe (Day of Jan 11).

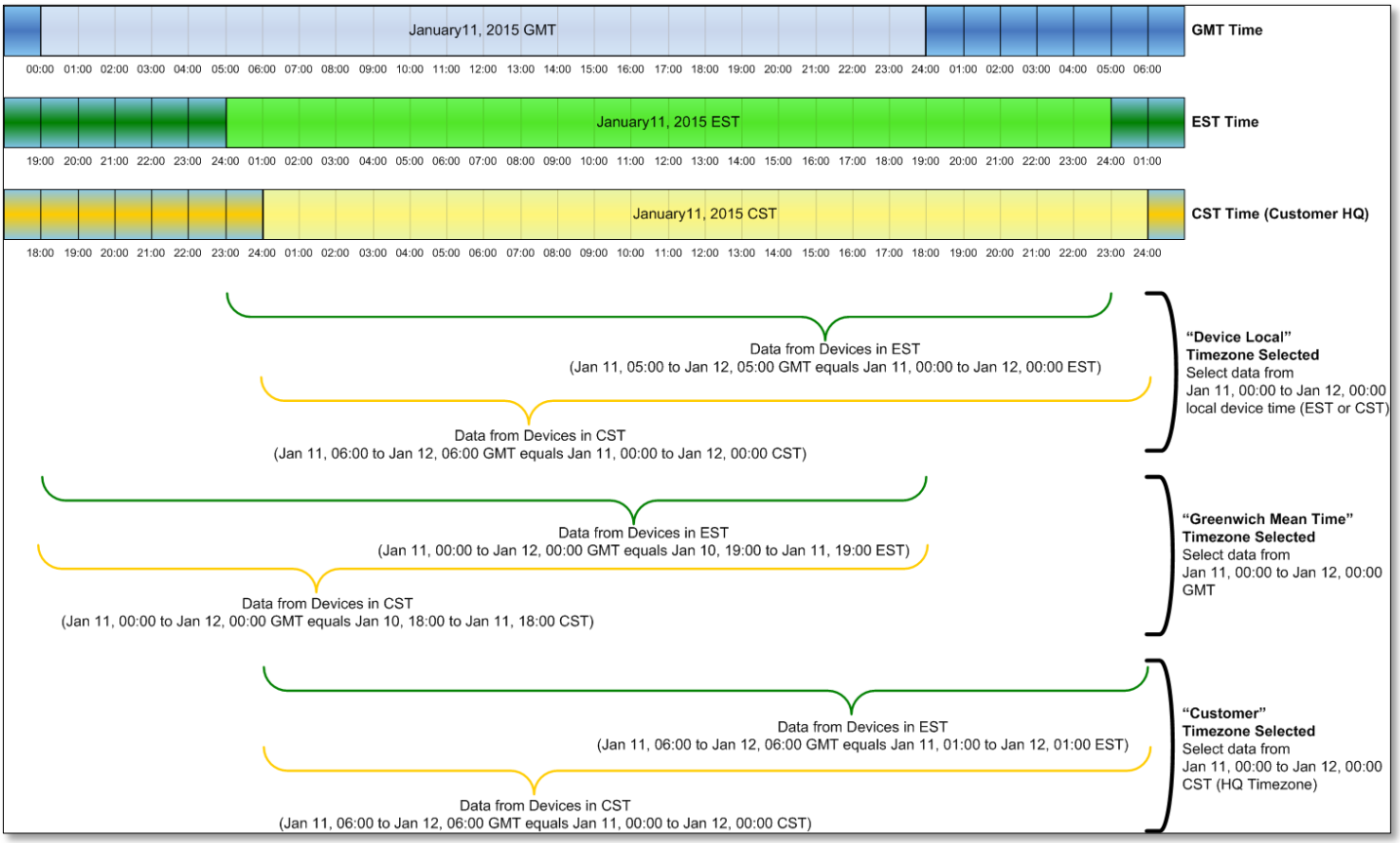


Figure 60 - Timezone Selection Example

In the example above, the midnight (00:00 on Jan 11) to midnight (00:00 on Jan 12) bounds of Jan 11 vary depending on which timezone filter value is selected. If "Device Local" is selected, data records within each devices local time (midnight to midnight) are used. If "Greenwich Mean Time is selected, midnight to midnight GMT is used (5 hours earlier local time for Eastern Standard Time or EST player devices and 6 hours earlier local time for Central Standard Time or CST player devices). In this example, the customer timezone has been defined as CST during customer setup. When the "Customer" filter value is selected, midnight to midnight CST is used.

7.1.2 Timeframe

A timeframe of "Year", "Month", "Day" or "Custom" can be selected. Each of these choices are detailed below.

- "Year"- Play data records for a chosen year will be included within the report. Select to open a year picker and choose a year. An example year picker is below (defaults to the current year).

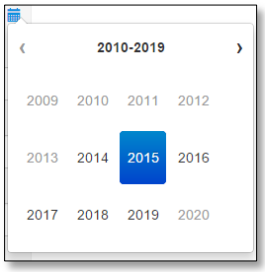


Figure 61 - Timeframe Year Picker

- "Month" - Play data records for a chosen year will be included within the report. Select to open a month picker and choose a month. An example month picker is below (defaults to the current month).

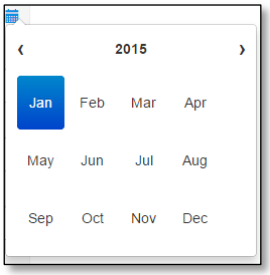


Figure 62 - Timeframe Month Picker

- "Day" - Play data records for a chosen day will be included within the report. Select to open a date picker and choose a date. An example date picker is below (defaults to the current date).

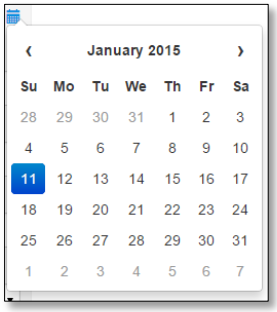


Figure 63 - Timeframe Date Picker

- "Custom" - Supports generation of a report with timeframe bounds that are set explicitly. After selecting "Custom", 2 date and time pickers will be available for selection (see Figure 51 and Figure 52 for example views of a date and time picker). Select the top to open a picker that supports choosing the timeframe start. Select the bottom to open a picker to choose timeframe end. Selected timeframe boundaries (selected to the minute) will be displayed as shown in the example below (reports play data records from 14:10 to 15:20 on Jan 11, 2015).

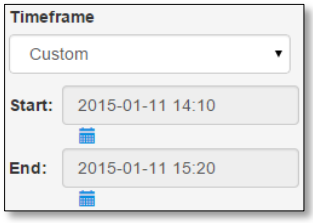


Figure 64 - Timeframe Custom Boundaries

7.1.3 Scope of Player Devices

Filters support which player devices contribute data to reports. By default, data is included from all customer devices regardless of division, site, or department assignment (if assigned at all). Filter controls support selection of devices within a single division, single site, single department or even selection of a single device.

To include player device data from all devices within a single division, select the division within the "Divisions" list.

To include data from all devices within a single site, select the division in which the site resides (within the "Divisions" list). Next, select the site within the "Sites" list.

To include data from all devices within a single department, select the division and site in which the department resides (within the "Divisions" and "Sites" lists respectively). Then, select the department within the "Departments" list.

To include date from a single device that is not assigned to any division, site or department, simply select the device from the "Devices" list. To include data from a single device that is assigned to a division, site or department, select the appropriate division, site and department and then select the device from "Devices".

7.1.4 Scope of Ads

By default, playback records for all ads are displayed within reports. Users can limit reports to single ads by selecting an ad within the "Ads" list.

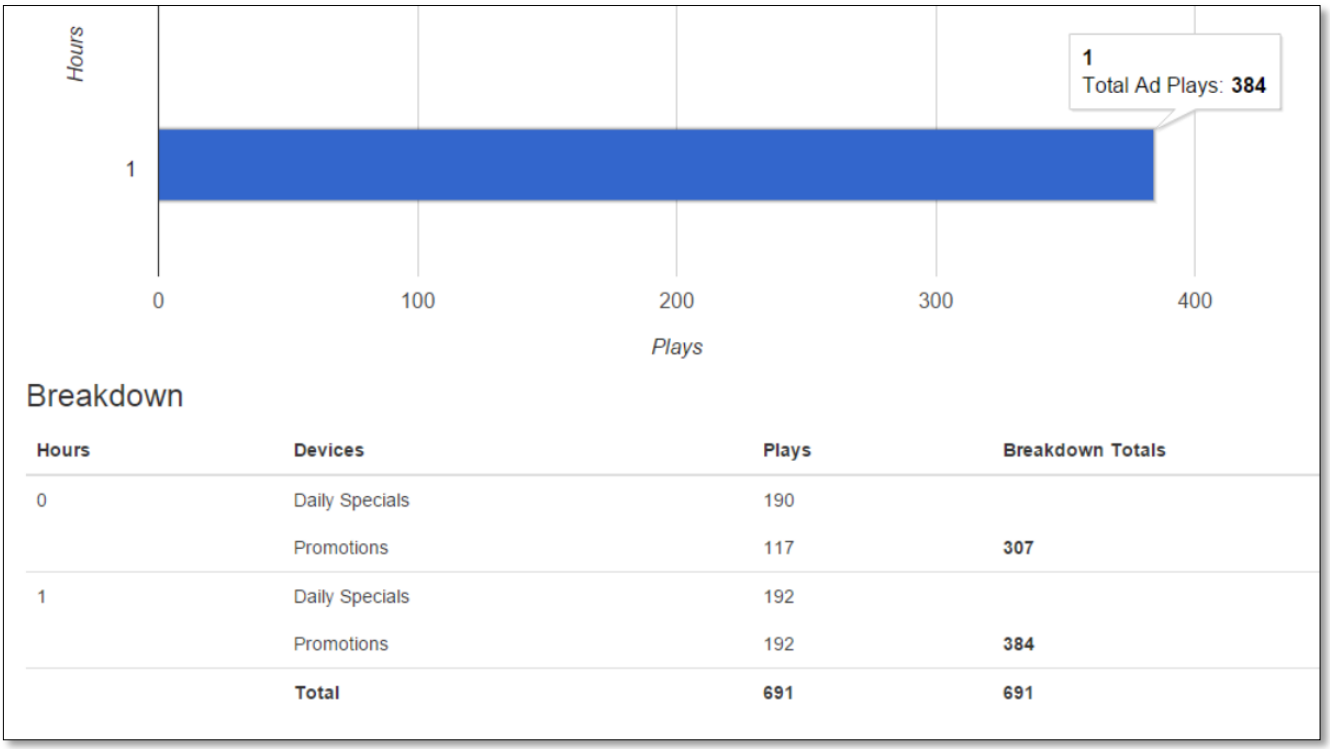
Available ads for a selection within the Ads list will be all customer ads that have played at any time in the past. The list contents are not updated based on other filter values.

7.1.5 Report Breakdown Options

Reports show play totals for each hour of a selected day or each day of a selected month, or each month of a selected year.

If a custom report timeframe is selected that is less than a day, totals for each hour are shown and if a custom report timeframe that is less than a month is selected, totals for each day are shown. Otherwise, totals for each month are shown.

In all cases, by default, the total of all plays are shown. As an option, users can view a breakdown the total shown for each hour, day or month. This breakdown will show sub-totals for contributing divisions, sites, departments, devices or ads that make up the total. For example, if a "Breakdown" list selection of "Devices" is made and a report is generated for a day, the sub-total for each device within each hour will be shown along with the hourly totals as shown below.



Breakdown

Hours	Devices	Plays	Breakdown Totals
0	Daily Specials	190	
	Promotions	117	**307**
1	Daily Specials	192	
	Promotions	192	**384**
	Total	**691**	**691**

Figure 65 - Report Breakdown Example

In the example report element above, hour "1" within the reported date (1 AM to 2 AM) has 384 total plays. A "Breakdown" on "Devices" has been selected. The contribution from each player device to the totals is then shown. For hour "1", the "Daily Specials" player device registered 192 plays and the "Promotions" player device also registered 192 plays. The total plays for the hour was 384. This total is also shown by the callout on the hour "1" bar in the chart above.

Breakdown sub-totals within reports are an effective tool for comparing different divisions, sites, departments, devices or ads.

7.2 Report View

The example below shows a report view for the date of January 11, 2015.

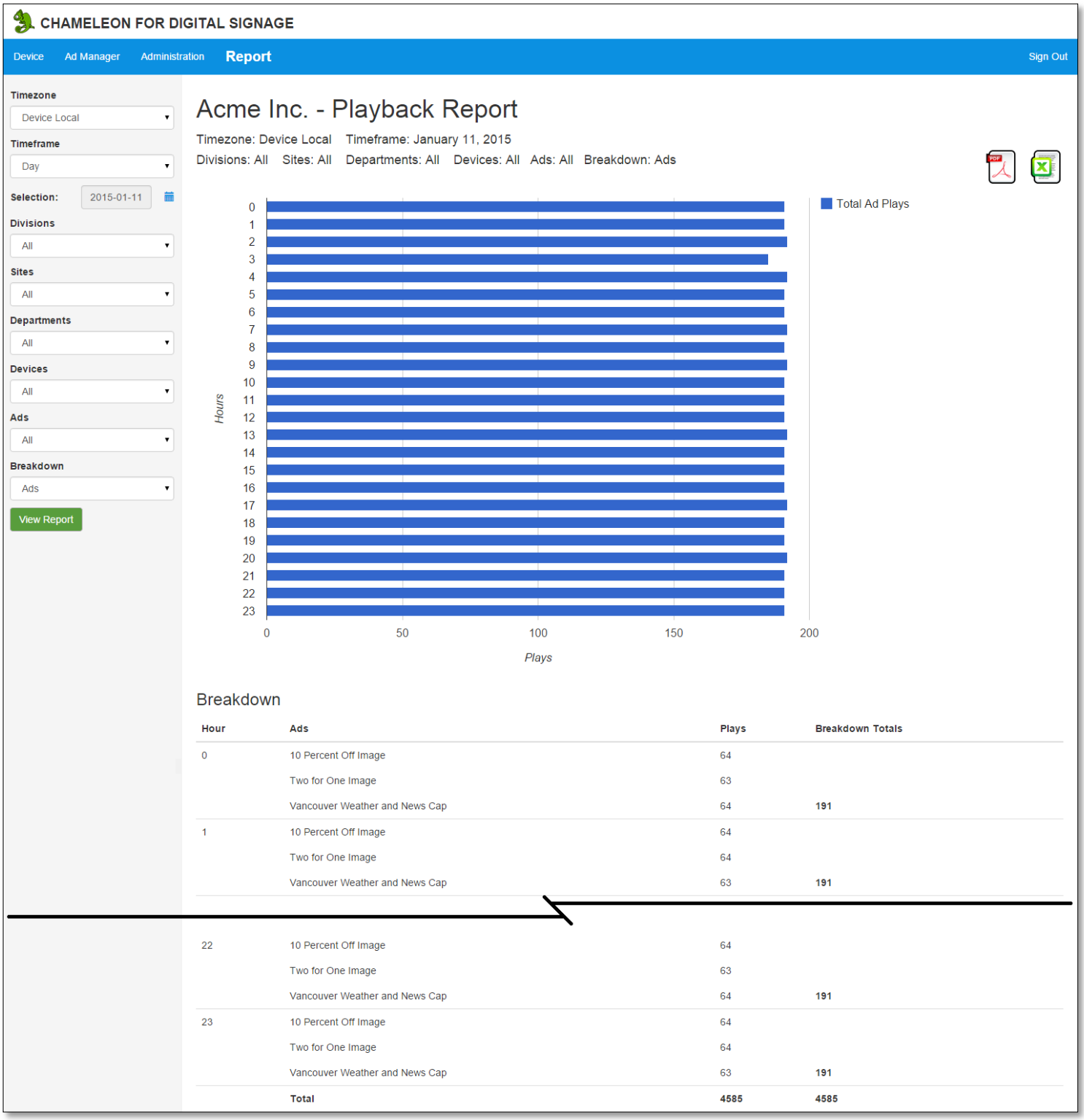


Figure 66 - Report View

At the top of the report view on the preceding page, all filter values used to generate the report are shown within the report header.

To the right of the header are icons supporting export of the reports to PDF or Microsoft Excel files (discussed in sections that follow.

Below the header, a bar graph shows data. Moving the mouse pointer over any bar will show a callout with details about bar values. For reports showing records for a day, a bar for each hour is shown. For reports showing records for a month, a bar for each day is shown and for reports showing records for a year, a bar for each month is shown.

Below the bar graph, raw data is shown along with any selected (optional) breakdown for hours, days or months.

All breakdowns and hourly, daily or monthly totals are shown along with a grand total at the bottom of raw data.

7.3 Exporting Reports to PDF Files

Select the icon that is to the right of the report view header to export the report view to a pdf file. Pdf file support is ubiquitous. These files can be opened by almost every PC. Export to a pdf whenever a report view needs to be shared with others. Appendix A - PDF Export Example Pages within this document shows an example pdf export that corresponds to Figure 66 - Report View.

The name of the pdf file includes the customer name with GMT date and time. The example file name:

acme_inc._150114194908538.pdf

... may be broken down as:

acme_inc._yymmddhhmmsslll where yy=year, mm=month, dd=day, hh=hour, mm=minute, ss=second, lll=millisecond.

This naming convention ensures that names of exported pdf files are unique.

7.4 Exporting Reports to Microsoft Excel Files

Select the icon that is to the right of the report view header to export the report view to a Microsoft Excel .xlsx file. .xlsx files can be opened by Microsoft Excel version 2007 and later. Export to a .xlsx to generate custom reports using reported data. All raw data, breakdown data and totals are exported into individual cells for use within custom reports. As a starting point, 2 tabs are created within each .xlsx file. A "C4DS Plays Report" tab includes report header data, a bar graph and cells that include bar graph values. A "C4DS Breakdown Report" tab includes raw data, breakdown totals and grand total values. Appendix B - Microsoft Excel Export Example Pages within this document shows an example Microsoft Excel export that corresponds to Figure 66 - Report View.

The name of each exported .xlsx file includes the customer name with GMT date and time. The breakdown of this filename matches that of .pdf file names as described within section 7.3 above.

8 Dashboard Administration Tab

The Administration tab supports alteration of the default dashboard user account that is provided by Deviceworx to customers, the addition of new user accounts, and the stipulation of optional locale for a customer network.

To make administration changes, select the "Administration" tab within the blue dashboard header. Additional sub-tabs will be shown below supporting user account changes and changes to locale including divisions, sites and departments.

8.1 User Administration

Selecting the "Users" sub-tab will show a form that lists currently set user accounts as shown in the figure below.

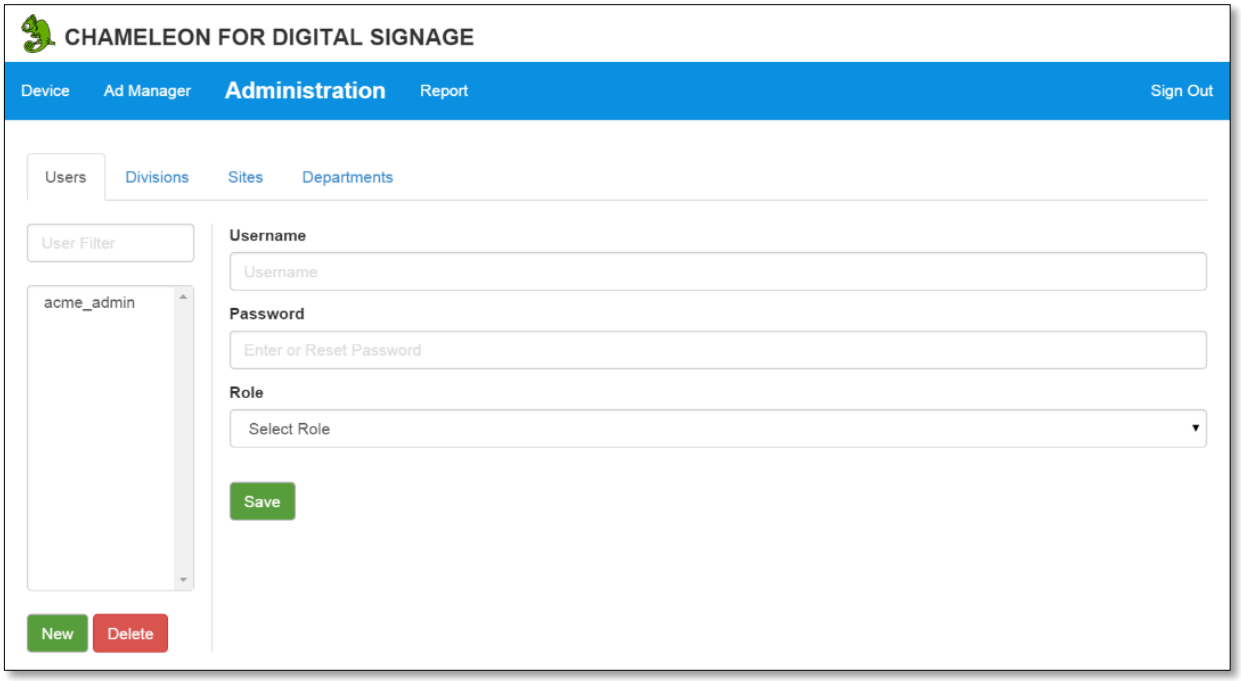


Figure 67 - Administration of Users

Select a user and update any of the attributes shown.

- "Username" - A label for each user that is entered during account dashboard login.
- "Password" - The password supporting user account access to the dashboard.
- "Role" - User account type.
    - "Administrator" Type - Full access to all dashboard functions.
    - "Installer" Type - Dashboard access is limited to the "Devices" tab. Persons responsible for the installation of player devices typically do not need to view dashboard forms other than those under the "Devices" tab. They may use the device list within the "Devices" tab to view device connection status and they may update device attributes including "Device Contact Details". When installers are on site, they will be in a good position to retrieve and record local contact details for each install location (i.e. who to contact at the install location whenever a device issue, such as disconnected power, needs resolution).

Add a new user by selecting "New" under the user list.

Delete existing users by choosing them within the list and then selecting "Delete".

8.2 Locale Administration

Locales support definition of geographic player device locations and support grouping of players by these locations. Within the C4DS dashboard, locale definition is limited to:

- Divisions - Commonly denote a region including a collection of installation locations or sites (e.g. a state or province).
- Sites - Typically denote a single location (e.g. a store).
- Departments - An area within a site.

C4DS customers can use these 3 levels of locale as they see fit to organize their players and are not limited to the common usage described above. For example, a multi-national network operator may use divisions to denote countries and not states or provinces.

To create a locale, any locales with wider scope must first be created (e.g. to create a site, a division must first be created).

Locales provide a variety of benefits:

- Organizing player devices geographically. The tree control within the "Devices" tab is useful at giving C4DS users the ability to filter which geographic they view and devices installed within that region.
- Organizing statistics. Filtering on locales provide a means of extracting statistics for specific geographic regions.
- Comparing statistics. Breakdown of reporting results by locale to comparing statistics from various regions.

8.2.1 Division Changes

Select the "Divisions" tab to view current divisions, edit divisions, add new divisions or delete divisions. See the figure below.

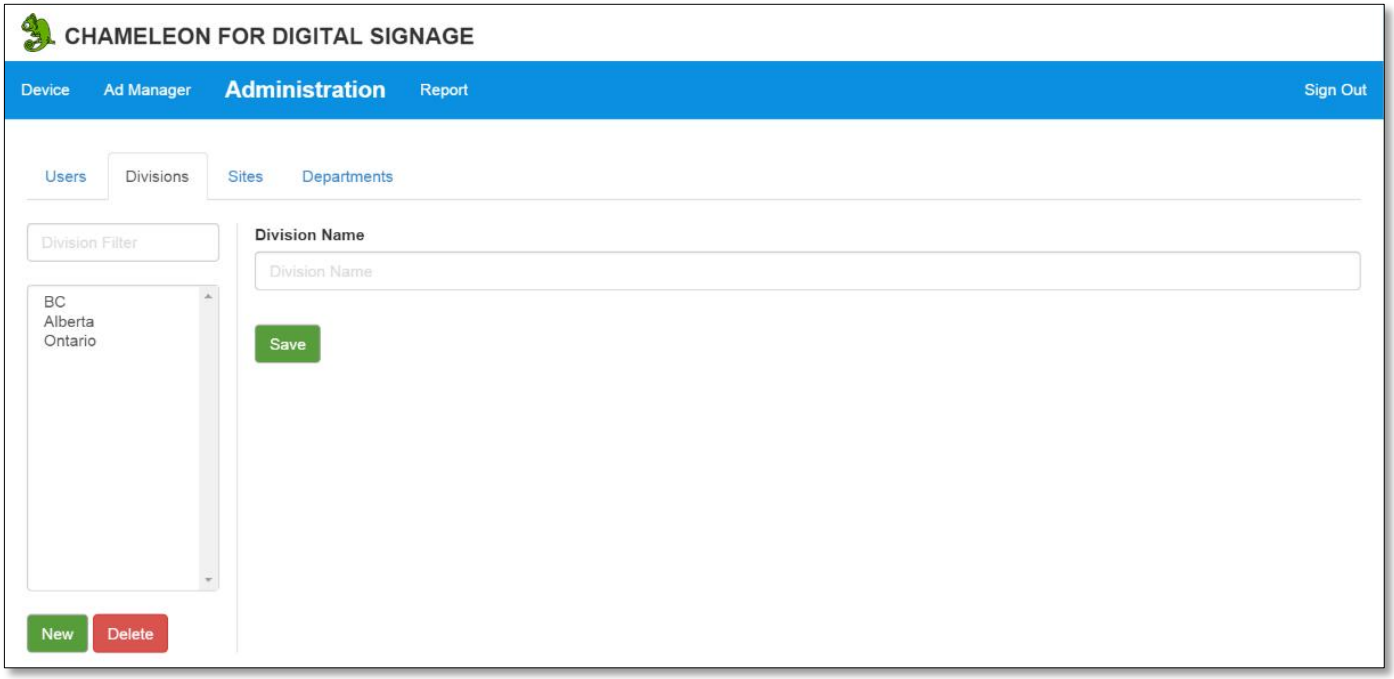


Figure 68 - Division Changes

To edit a division, choose it in the list, alter its "Division Name" and then select "Save".

Select "New" to create a new division. Enter the "Division Name" and select "Save".

To delete a division, choose it in the list and select "Delete". Note that divisions cannot be deleted if there are any devices or sites assigned to the division. Devices must first be moved or deleted and sites must be deleted before the division can be deleted.

8.2.2 Site Changes

Select the "Sites" tab to view current sites, edit sites, add new sites or delete sites. See the figure below.

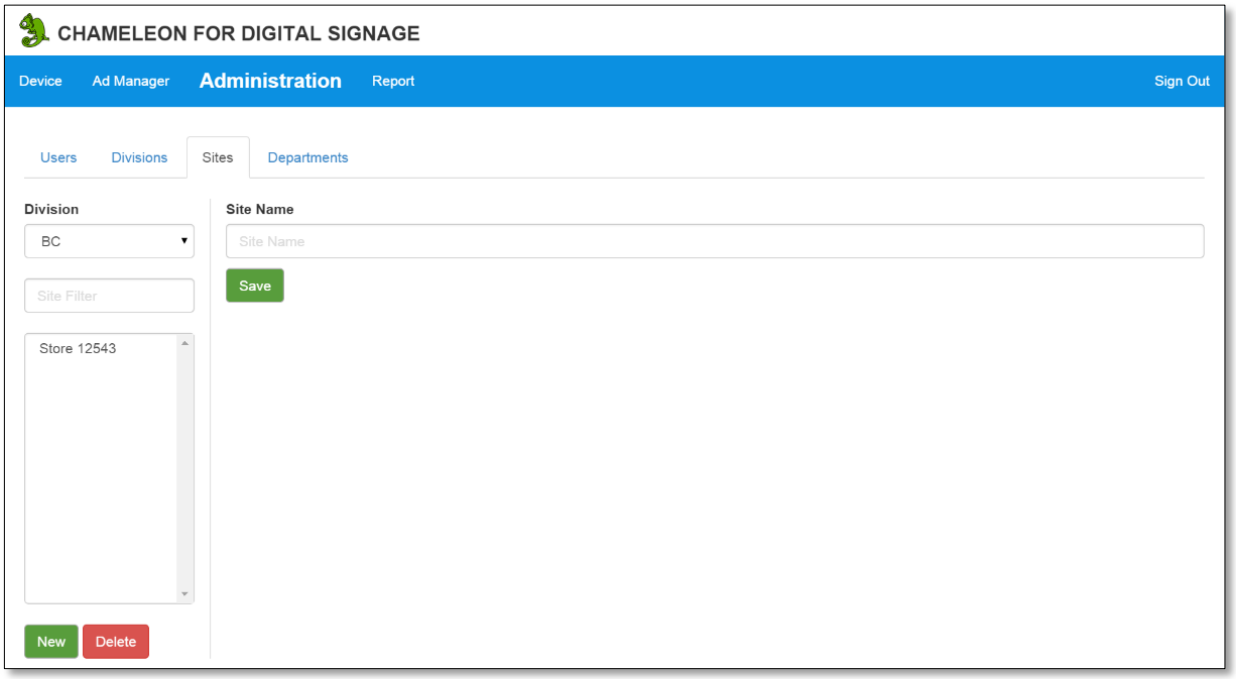


Figure 69 - Site Changes

To edit a site, choose it in the list, alter its "Site Name" and then select "Save".

Select "New" to create a new site. Enter the "Site Name" and select "Save".

To delete a site, choose it in the list and select "Delete". Note that sites cannot be deleted if there are any devices or departments assigned to the site. Devices must first be moved or deleted and departments must be deleted before the site can be deleted.

8.2.3 Department Changes

Select the "Departments" tab to view current sites, edit sites, add new sites or delete sites. See the figure below.

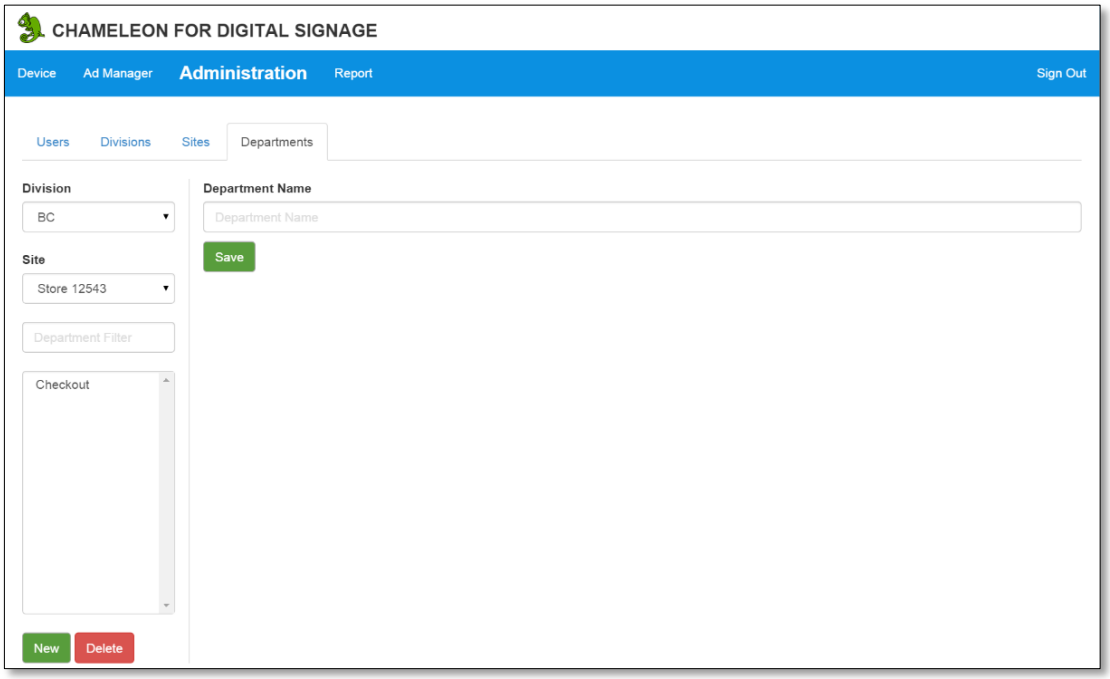


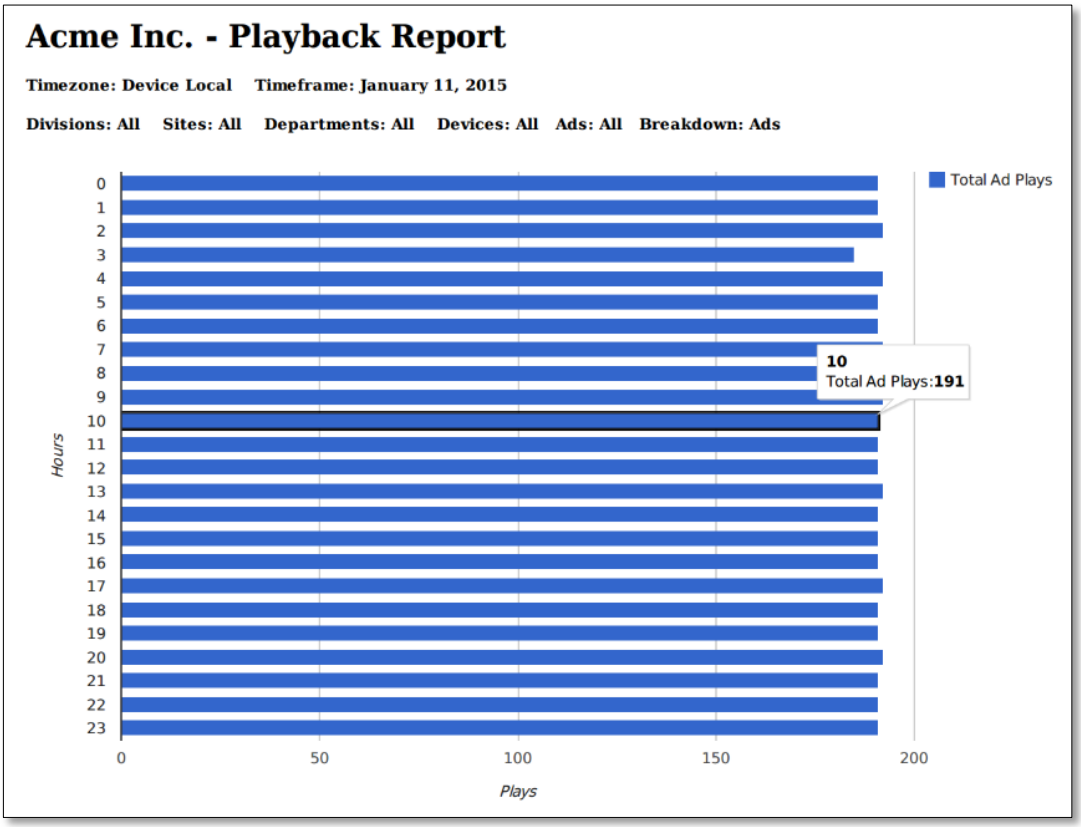
Figure 70 - Department Changes

To edit a department, choose it in the list, alter its "Department Name" and then select "Save".

Select "New" to create a new department. Enter the "Department Name" and select "Save".

To delete a department, choose it in the list and select "Delete". Note that departments cannot be deleted if there are any devices assigned to the department. Devices must first be moved or deleted before the department can be deleted.

9 Appendix A - PDF Export Example Pages



Breakdown

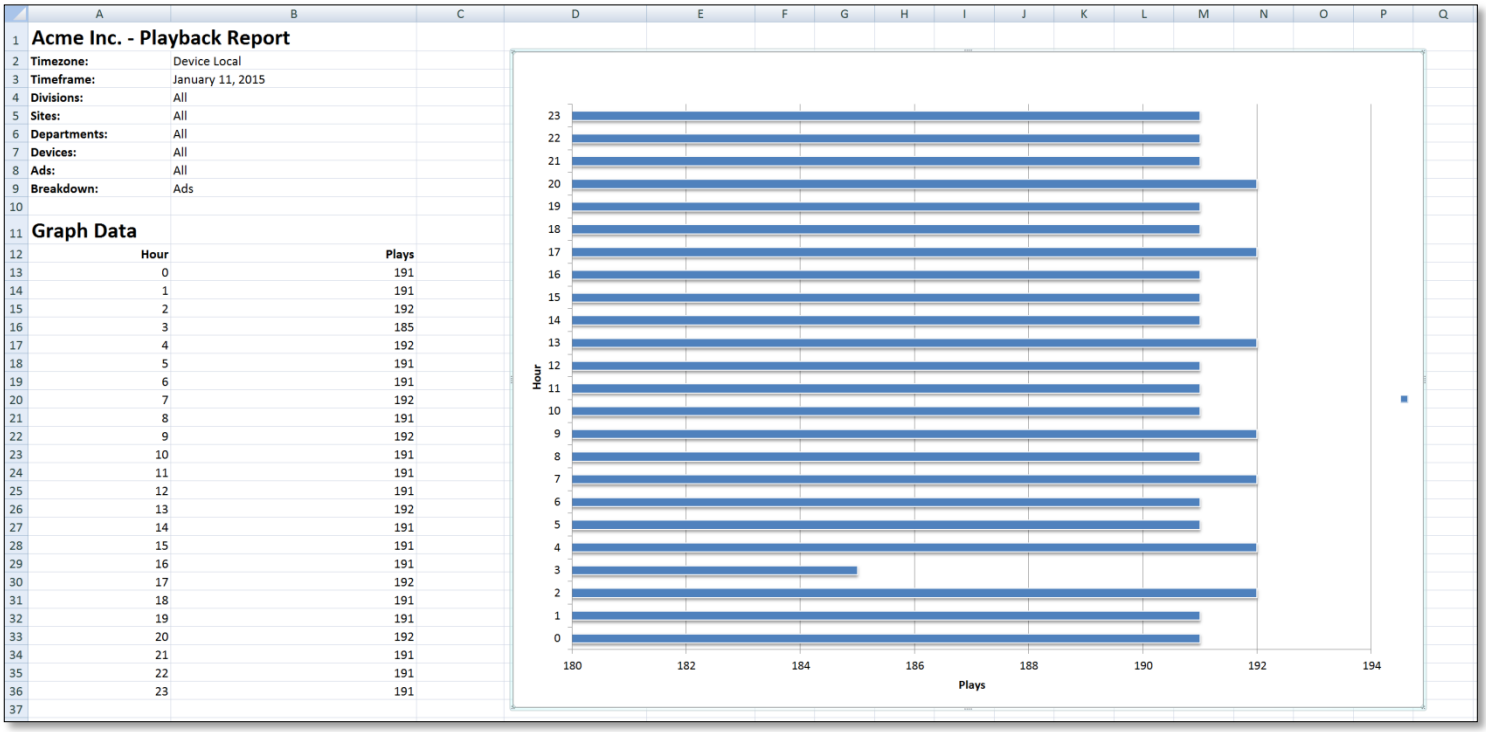
Hour	Ads	Plays	Breakdown Totals
0	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
1	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
2	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
3	10 Percent Off Image	61	
	Two for One Image	62	
	Vancouver Weather and News Cap	62	**185**
4	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
5	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
6	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
7	10 Percent Off Image	64	
	Two for One Image	64	

Hour	Ads	Plays	Breakdown Totals
	Vancouver Weather and News Cap	64	**192**
8	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
9	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
10	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
11	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
12	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
13	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
14	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
15	10 Percent Off Image	64	
	Two for One Image	64	

Hour	Ads	Plays	Breakdown Totals
	Vancouver Weather and News Cap	63	**191**
16	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
17	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
18	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
19	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
20	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
21	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
22	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
23	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
	Total	**4585**	**4585**

10 Appendix B - Microsoft Excel Export Example Pages

An Excel workbook "C4DS Plays Report" tab example is shown below.



Acme Inc. - Playback Report	
Timezone:	Device Local
Timeframe:	January 11, 2015
Divisions:	All
Sites:	All
Departments:	All
Devices:	All
Ads:	All
Breakdown:	Ads

Graph Data

Hour	Plays
0	191
1	191
2	192
3	185
4	192
5	191
6	191
7	192
8	191
9	192
10	191
11	191
12	191
13	192
14	191
15	191
16	191
17	192
18	191
19	191
20	192
21	191
22	191
23	191

Pages that follow show an example Excel workbook "C4DS Breakdown Report" tab.

Acme Inc. - Playback Report

Timezone:	Device Local
Timeframe:	January 11, 2015
Divisions:	All
Sites:	All
Departments:	All
Devices:	All
Ads:	All
Breakdown:	Ads

Breakdown

Hour	Ads	Plays	Breakdown Totals
0	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
1	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
2	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
3	10 Percent Off Image	61	
	Two for One Image	62	
	Vancouver Weather and News Cap	62	**185**
4	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
5	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
6	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
7	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
8	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
9	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
10	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**

11	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
12	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
13	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
14	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
15	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
16	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
17	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
18	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
19	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
20	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**192**
21	10 Percent Off Image	63	
	Two for One Image	64	
	Vancouver Weather and News Cap	64	**191**
22	10 Percent Off Image	64	
	Two for One Image	63	
	Vancouver Weather and News Cap	64	**191**
23	10 Percent Off Image	64	
	Two for One Image	64	
	Vancouver Weather and News Cap	63	**191**
	Grand Total	**4585**	**4585**