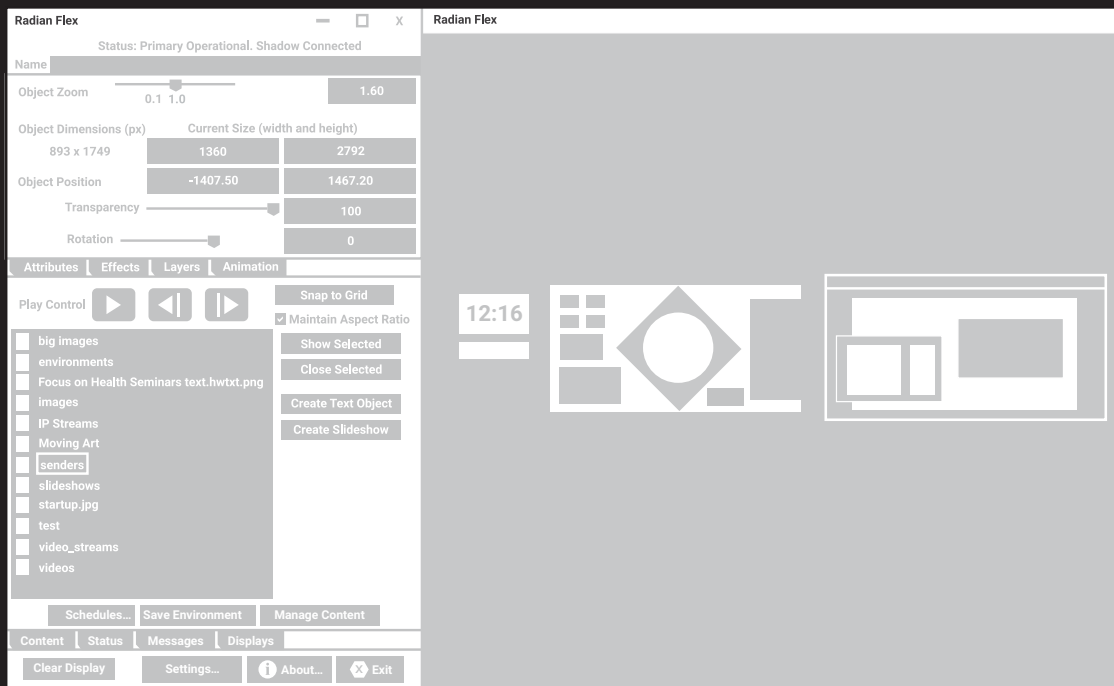# USER MANUAL

VW-FLEX SERIES

RADIAN FLEX VIDEO WALL PROCESSOR

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CHAPTER 1: OVERVIEW

1. OVERVIEW

Radian Flex is software that powers the most cutting-edge video walls and distributed visualization systems available today.

Radian Flex software allows you to see the big picture—in detail. Bring together information from many sources, showing large amounts of information in a single glance. Improve image analysis. Create more informed collaboration and decision-making across your organization and in conversation with your customers. Enhance your audience's experience.

Radian Flex Xa manages and controlling access to Radian Flex software and Radian Xd Streamer for streaming content from capture cards. Radian Flex provides click-and-drag object resizing and rotation and the ability to multi-select a group of objects on the Control Screen to manipulate the objects as a group.

1.1 SOFTWARE OVERVIEW

Radian Flex is available in two software suites: Radian Flex Pro and Radian Flex Standard. The Radian Flex Pro can have two computers running Controller software to provide fault tolerance, while the Radian Flex Standard only has one Controller. Figure 1-1, below, illustrates the Radian Flex Pro with two Controllers and a Key Node so the system can tolerate the failure of one of the Controller computers.

Figure 1-1 also shows several computers running Radian Xd software and two computers running Radian Xc — ControlBridge Operator software. Radian Xd software is for creating and delivering just-in-time content from streaming video, desktop capture windows, and IP cameras. Radian Xc — ControlBridge Operator software provides a basic user interface for remote access and simplified control.

Computers running Radian Xt UHD or HD Viewer software provide the Radian Flex system's output and form the video wall shown in Figure 1-1. The Radian Xt UHD or HD Viewer displays are illustrated here in a standard grid but can be arranged in custom configurations— for instance, multiple video walls and satellite displays on multiple surfaces. The display computers have the option of running Radian Xt HD Viewer or Radian Xt UHD Viewer software to drive higher resolution displays.

A gigabit Ethernet network switch, configured to support IGMP, and optional router connect the Radian Flex System to the internal LAN and external Internet.
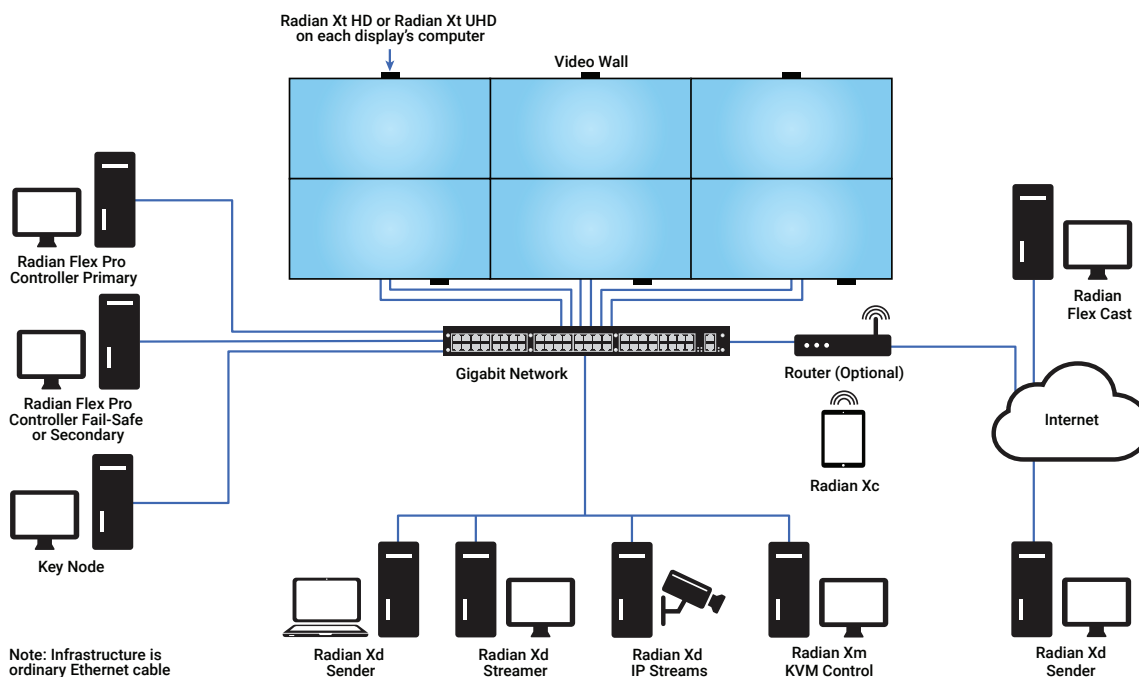
FIGURE 1-1. TYPICAL APPLICATION

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The next three sections review the Radian Flex Pro and Radian Flex Standard – and their many options for customization.

Radian Flex software is a powerful, easy-to-use solution for the input of content, control and management of that content on the video wall and distributed visualization system, and the output of content to the displays. Figure 1-2, below, illustrates the software components.

Xd Sender	Radian Flex Pro	Radian Flex Standard	Radian Xt Software

Xd Streamer	Xd IP Stream Software	Xc Software
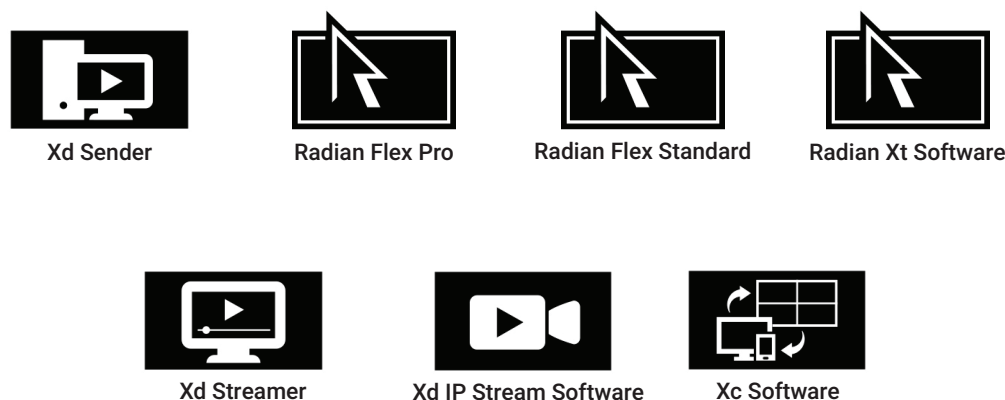
FIGURE 1-2. SOFTWARE COMPONENTS

1.1.1 CONTROLLING AND MANAGING CONTENT

The Radian Flex Pro has the option of having two control points working in tandem to provide fault tolerance. If there is a disruption to one Controller computer's operation, the second Controller computer takes over to maintain content and provide continuous operation of the Radian Flex System. The Radian Flex Standard has a single computer running Controller software.

The Radian Flex Controller Software is powerful, flexible, and easy-to-use. The intuitive user interface offers design freedom.

Bring in Radian Xd content from capture cards, desktop capture, video files, and IP camera streams. Move and resize content; duplicate, zoom and rotate; and adjust transparency and color as easily as moving and resizing the windows on the desktop of a personal computer. Use SmartFrame to set up content in seconds to fit the display boundaries of your video wall. Animate your content by moving an object across a path of your choice and applying visual effects with colors and filters. Arrange and save content in pre-set combinations, called Radian Flex Environments, and use the Radian Flex Scheduler to automatically change content on your video wall throughout the day and night.

Manage and control access to Radian Flex software with Radian Flex Xa, a capability in the Controller software.

Radian Flex Xa provides options for user authentication (login), tracking of user activities for accountability (logging), and choosing which actions users can perform (permission checking). Require all users to log-in or use the auto-login option to bypass logging-in. With either option, Radian Flex Xa continues to log user actions for accountability. Radian Flex Xa is included with Radian Flex Pro and is an option for Radian Flex Standard.

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1.1.2 RADIAN FLEX XC AND XS SERVICES: PROVIDING MORE OPTIONS FOR CONTROL

Both the Radian Flex Pro and Radian Flex Standard have the option of adding computers running Radian Xc — ControlBridge Operator software. Use Radian Xc — ControlBridge Operator to control and manage your video wall and distributed visualization system from additional computers, whether across the office or around the world.

Radian Xc — ControlBridge Operator provides a basic, streamlined control interface designed to supplement the full array of functions, settings, and preferences available with the Radian Flex Controllers.

Take your Radian Flex System into the next level of customized control with the Radian Flex Xs Services API Control License option, also known as External Interface. Use Radian Flex Xs Services to program external, hand-held devices and proprietary programs to interact with and control your Radian Flex System.

1.1.3 OPTIONS FOR XD SENDER, XM KVM CONTROL AND FLEX CAST

Radian Xd software creates and delivers live, just-in-time content to your video wall and distributed visualization system. In addition, there are two options to enhance your Radian Xd content—Radian Xs and Radian Flex Cast.

Radian Xd software has three software components—Sender, Streamer, and IP Streams. Use Radian Xd to view on your video wall almost any application running on almost any computer, whether on the local network or across the Internet. Stream video stored on other computers and capture live sources or pick up live feeds from IP cameras and RTSP streams.

The Radian Xs option for Radian Xd makes it easier to control desktop capture on Sender and Streamer computers. Radian Xs is also known as Keyboard-Video-Mouse or KVM. Use your keyboard, mouse, and monitor on your Controller and Radian Xc — ControlBridge Operator computers to create and control desktop capture windows on your Sender and Streamer computers.

Use Radian Flex Cast —Source Remote Broadcasting software to enhance the timing and consistency of your communications across your Radian Flex Systems in multiple locations. Radian Flex Cast —Source Remote Broadcasting shares slide shows, animations, and environments, and also live video feeds, data files, and stored video and images.

1.1.4 VIEW AND INTERACT WITH CONTENT ON RADIAN XT UHD OR HD VIEWER DISPLAYS

Radian Xt UHD or HD Viewer software powers the display monitors on your video wall and satellite displays for showing and interacting with content. In both the Radian Flex Pro and Radian Flex Standard, a computer running Radian Xt UHD or HD Viewer software controls each display and provides storage for quickly loading content. There are two Radian Viewer options: Radian Xt HD Viewer and Radian Xt UHD Viewer.

The Radian Flex Pro comes with Layout Control, which is available for the Radian Flex Standard as an option. Use the Layout Control capability to expand your video wall into custom configurations of display walls and satellite monitors and display devices. For instance, mix landscape and portrait displays, design innovative arrangements of displays beyond the standard grid, and create multiple video walls and monitors across multiple surfaces in your viewing spaces. With Layout Control, use your imagination to artfully blend your Radian Flex distributed visualization system into your physical environment.

Radian Xt UHD or HD Viewer software also has options for display resolution – choose from Radian Xt HD Viewer or Radian Xt UHD Viewer options. Radian Xt HD Viewer is for monitor resolution of 1920 x 1080 pixels. For resolutions more than that, use Radian Xt UHD Viewer. Radian Flex Pro can mix HD and UHD options to accommodate the custom configurations possible with Layout Control. Radian Flex Standard can use HD or UHD but not both at the same time unless using the Layout Control option. Layout Control allows the use of HD and UHD at the same time.

1.1.5 UPGRADING YOUR RADIAN FLEX SYSTEM

Remember that Radian Flex offers a Software Maintenance Agreement to keep your Radian Flex software current and expedite support. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for more information.

We are continuously developing and improving Radian Flex software in response to customer feedback and to share our enthusiasm for the many benefits of communicating with video walls and distributed visualization systems.

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Whether it's new display technology, faster CPU and memory, or a bigger display wall with more satellite displays, upgrade your hardware and Radian Flex software over time to adapt to your changing needs and future technology.

1.2 ABOUT THIS USER'S MANUAL

This Radian Flex User's Guide has ten chapters:

- Chapter 1: Overview
- Chapter 2: Quick Start Guide
- Chapter 3: Hardware and License Requirements for the Radian Flex
- Chapter 4: Installing and Updating the Radian Flex Software Suites
- Chapter 5: Configuring and Managing Walls and Displays
- Chapter 6: Display and Interact with Content
- Chapter 7: Two Controllers: Radian Flex Fault Tolerant Operations with the Radian Flex Pro
- Chapter 8: Radian Xd and Radian Flex Cast: Creating and Delivering Dynamic, Just-in-time Content (Including Radian Xs Option)
- Chapter 9: Bringing Content to Life: Radian Flex Environments, Slideshows, and Animations
- Chapter 10: Advanced Radian Flex Control: Radian Xc — ControlBridge Operator, Radian Flex Scheduler, and Radian Flex Xs Services API Control License
- Chapter 11: Customizing Your Radian Flex
- Chapter 12: Summary of How Radian Flex Works

1.3 TERMS TO KNOW

Here are some terms to know before you start using Radian Flex:

- Animation: A user-defined sequence of steps that controls the way a content object is displayed, including its size, position, rotation and effects, such as transparency. The user may specify an interval between pairs of steps, during which object properties will be interpolated between the two steps.
- Content Object: A piece of content you want to show on your wall. Content objects can be graphics, computer applications, video, and more. You can show more than one content object on wall at the same time and you can show the same content object in multiple places on the wall.
- Controller: Manages the entire Radian Flex installation. It allows you to control what content appears on your wall, where it appears and how it appears.
- Control Panel: The area in the Controller software where you select content objects. It appears on the left side of the Control Screen.
- Control Screen: The area in the Controller software that shows a representation of the Radian Flex video wall. The Control Screen appears on the right side of the Control Panel. Using the WYSIWYG interface, you can drag content objects around the Control Screen, which positions them on your wall.
- Display Wall: The display wall, also known as a video wall, consists of multiple monitors that are physically adjacent to each other. These monitors can include embedded computers or each can be controlled by a separate computer. See Radian Xt UHD or HD Viewer definition.
- Dynamic Content: These dynamic, "just-in-time" content objects are driven by connected Radian Xd streaming software, thus they are only available when the source is connected. They can include streamed desktops/applications and movies, as well as video from capture devices. (See Streaming Content definition.)
- Environment: A saved arrangement of multiple content objects so you do not have to recreate it every time you want to show it. A Radian Flex Environment can contain any combination of images, big images, videos, dynamic content, and slideshows.

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- Fault Tolerance: Support for fault tolerance is a feature in the Radian Flex Pro that provides support for two simultaneously active Controllers. If one of the Controllers fails or is disconnected, the other Controller keeps the system operational.

- Radian Flex Xa: Manage and control access to Radian Flex software with Radian Flex Xa, which is part of the Controller software. Radian Flex Xa provides for user authentication (login), tracking of user activities (logging), and choosing which actions users can perform (permission checking). Radian Flex Xa comes with the Radian Flex Pro and is an option for the Radian Flex Standard.

- Radian Flex Cast —Source Remote Broadcasting: This product allows Radian Xd Sender feeds to be sent to multiple Radian Flex installations around the world. Multiple Senders can connect to Radian Flex Cast and then be distributed to several Radian Flex Systems. Settings are available to control what content can be distributed to which destinations.

- Layout Control: The Radian Flex Pro comes with Layout Control, which is available for the Radian Flex Standard as an option. Use Layout Control to expand your video wall into custom configurations of display walls and satellite monitors beyond the standard grid.

- Radian Xd IP Streams: Radian Xd IP Streams software connects to IP camera feeds and RTSP streams and delivers that content to the Radian Flex System. Includes IP camera discovery and profile selection.

- Radian Xd Sender: For some applications, you may want to show the screen of a personal computer as a content object on the Radian Xt Viewer displays. The Radian Xd Sender software enables you to do this. You can send the entire desktop and all applications or separate screen regions to send individual application windows.

- Radian Xd Streamer: A computer running Radian Xd Streamer software allows you to show streaming content on the Radian Flex display. In most cases, the Streamer shows its desktop applications or a live camera feed or video from a DVD or video tuner. Streamers support desktop/window capture and video capture cards, as well as many webcams and other video devices. For IP cameras and RTSP streams, use Radian Xd IP Streams.

- Radian Xc — ControlBridge Operator: This product provides powerful control capabilities to display and manipulate content on the Radian Flex with an easy-to-use interface. Multiple Radian Xc — ControlBridge Operators can be used simultaneously, even from remote locations.

- Radian Xt UHD or HD Viewer: The combination of a monitor and its controlling computer running Radian Xt UHD or HD Viewer software. This can be a monitor with an attached computer or the computer may be embedded in many commercial monitors. Radian Xt UHD Viewer and Radian HD Viewer are Radian Flex software options for display resolution.

- Radian Xv Layout: Expand your video wall into custom configurations of display walls and satellite displays beyond the standard grid. Add capabilities to the Radian Flex to view and manage content, including the mini-map on the control screen, which has pan-and-zoom capability, and more ways to use the mouse to move and resize content on the Control Screen. Add Wall Grid SmartFrame for a custom grid across the wall.

- Key Node: The Key Node is a separate computer running Key Node software that plays a role in license management for the fault tolerant Radian Flex Pro.

- Slideshow: A sequence of images, videos, and dynamic content shown as a slideshow. The Radian Flex System automatically loops through the sequence indefinitely with user-specified timing between each slide.

- Stored Content: Stored content includes movies and images that are stored on the system in the hard drives of the Controller computer(s) and Radian Xt Viewer computers, thus it is always available. Slideshows are active examples of Stored Content.

- Streaming Content: Video, IP camera feeds, or live screen capture content streamed to a Radian Flex System via Radian Xd software components. Sources include feeds from Radian Flex Pro and Radian Flex.

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1.4 NEW FOR RADIAN FLEX SOFTWARE VERSION 7

Here are the main updates for the Radian Flex Software version 7.

- Use Wall Grid SmartFrame to show a custom grid across a wall. Use the grid to make content arrangements more consistent and quickly fill and snap content to the grid. Control if Wall Grid SmartFrame is automatic or click a button to to snap content to your grid. Radian Flex systems with the Xv Layout capability have Wall Grid SmartFrame. Display Grid SmartFrame is an existing capability and comes with all Radian Flex systems.

- Anchor Mode is new. Show a content object on the Control Screen, position the object, and anchor it in place to prevent the object from moving when you are adding content nearby. You can add visual effects to anchored content.

- The Radian Flex Sync Option for Viewer and dvLED is a new option for Radian Flex version 7. Go to the Walls tab for buttons to control the Radian Flex Sync Option. The Radian Flex Sync Option gives significant performance and synchronization enhancement for seamless LED walls with multiple LED controllers. Radian Flex Sync enables a new-technology Viewer software that uses hardware-based synchronization to make the LED controllers connected to several Radian FlexView computers refresh at exactly the same time. Radian Flex software's enhanced video synchronization mechanisms greatly reduce the possibility of tearing or frame differences that could be visible on a seamless LED video wall.

- The Displays tab is now the Walls tab. The name change reflects the focus on managing and configuring video walls, including LED-based walls.

- The new Sources tab significantly improves management of Radian Flex Xd Source content. Click the links in the Sources tab to configure, manage, and show live feeds on your wall. Open new URLs in Radian Flex Xd Source Browser, open new RTSP Streams in Xd IP Streams, open Xd Sender and Streamer windows for simultaneous control of multiple sources, and use Radian Flex KVM to control Browser, Sender, and Streamer content from the Sources tab. KVM windows for Sender and Streamer allows simultaneous control of multiple sources from the Sources tab.

- Document changes over time with Source Snapshots – right-click on the live feeds of some Xd Sender and Streamer content to save Source Snapshots.

- Background Content Sync automatically synchronizes content from the primary Radian Flex Controller to the shadow Radian Flex Pro and all Viewer display computers. Turn on Background Content Sync in the System Setup tab via the Settings button.

- Use the new Wall Grid SmartFrame for consistent content arrangement and sizing across a wall. You specify grid size.

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CHAPTER 1: OVERVIEW

The new Sources tab significantly improves management of Radian Flex Xd Source content. See all your Source apps in a list and open directly from Sources tab. Use Radian Flex KVM to control Browser, Sender, and Streamer content from Sources tab. KVM windows for Sender and Streamer allow simultaneous control of multiple sources from the Sources tab.
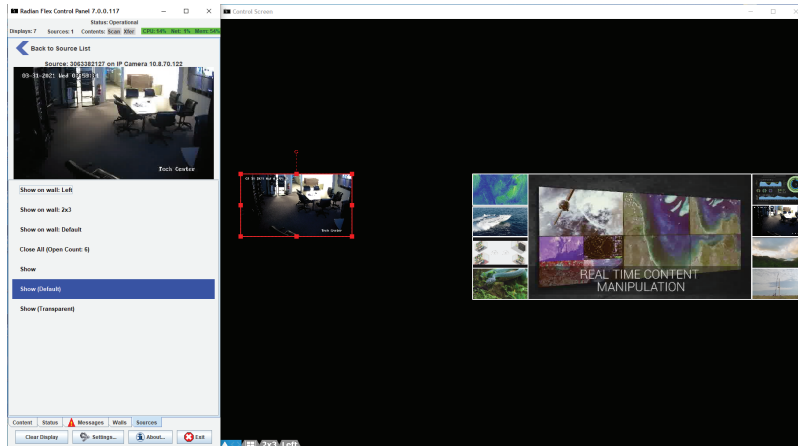
New Background Content Sync keeps content updated on Radian Flex Standard or Pro(s) and Viewer computers.

Right-click is new in Content List. There are several actions. For Radian Flex Xd Source Sender files, and some Streamer files, select Create Snapshot in the pulldown menu to document change over time.

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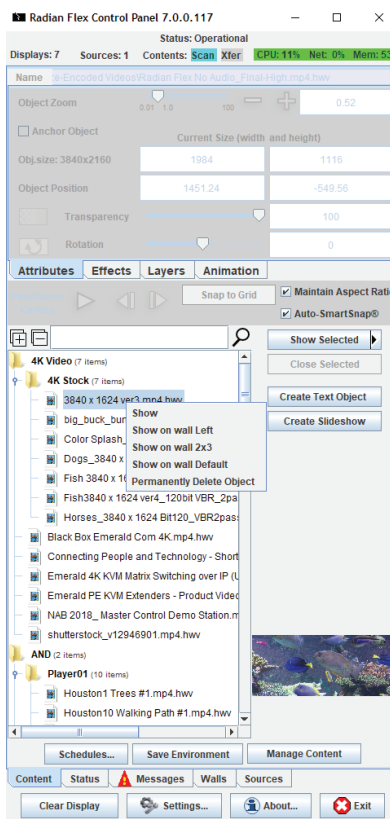
CHAPTER 1: OVERVIEW

For large or complex LED walls, the new Radian Flex Sync Option for Viewer gives significant performance and synchronization enhancement across multiple LED controllers. See Radian Flex Sync control buttons and checkbox in Walls tab (formerly Displays tab).
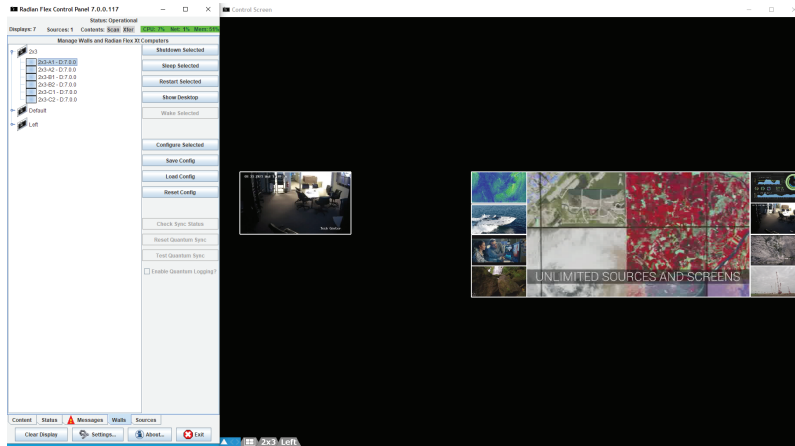
See more info in the Status bar, always on view on the Radian Flex Standard or Pro.
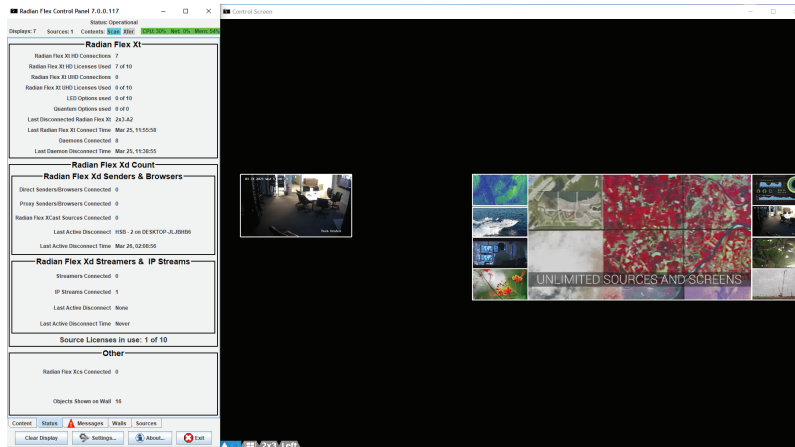
Anchor content on the Control Screen using the new Anchor Mode. There is a dashed border on anchored content. Apply filters, transparency, animation, and more to content in Anchored Mode.

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CHAPTER 2: QUICK START GUIDE

2. QUICK START GUIDE

About this chapter

Find what you need with this summary of the Radian Flex Software User Interface. This is a quick start guide.

This chapter is an introduction to the Radian Flex Software Software User Interface. Use this chapter to learn about the main features of the User Interface. There are sections that show how to use the Control Screen and the functions of the main tabs and buttons on the Control Panel. Use this chapter as a quick-start guide or continue to the next chapter.

2.1 ABOUT THE RADIAN FLEX SOFTWARE USER INTERFACE

The Radian Flex Software Software controls your Radian Flex Software Software video wall and distributed visualization system.

Every Radian Flex Software Software system has at least one Radian Flex Software System Standard or Pro. Radian Flex Pro systems with FailSafe, the Radian Flex Software fault-tolerance software, have two Radian Flex Pros.

Use the Radian Flex Software User Interface to import and show content, create content and content arrangements, login and control access, automate Radian Flex Software operation, customize settings and preferences, and check system status and the messages log, and more.
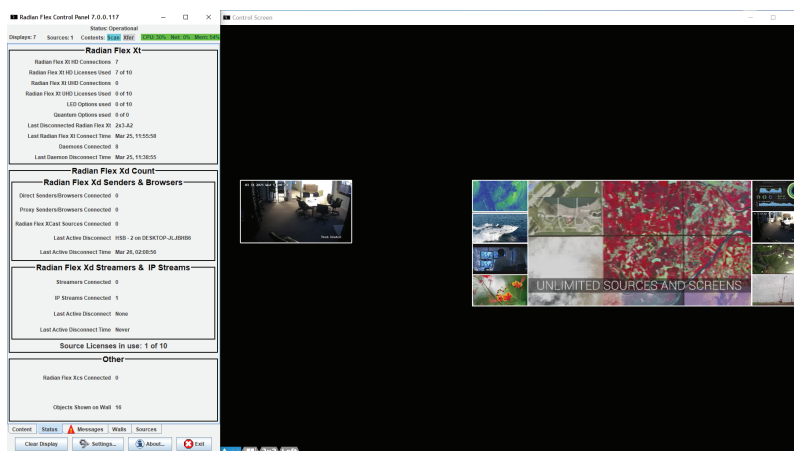
Control panel (left)   Control screen (right)

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CHAPTER 2: QUICK START GUIDE

2.2 STATUS BAR

Want to know how your Radian Flex Software Software system is doing? Take a quick look at the Status bar. The Status bar is always at the top of the Radian Flex. For details on system status, click the Messages, Status, and Sources tabs on the Radian Flex. The tabs are shown later in this chapter.

Status bar: Identifies type of Radian Flex Software System and number of Standard or Pro Controllers, Displays, Sources, Contents Scan or Xfr, Percent CPU, Network, and Memory – Green = OK, Red = check Messages tab on Standard or Pro Controller.

Status bar
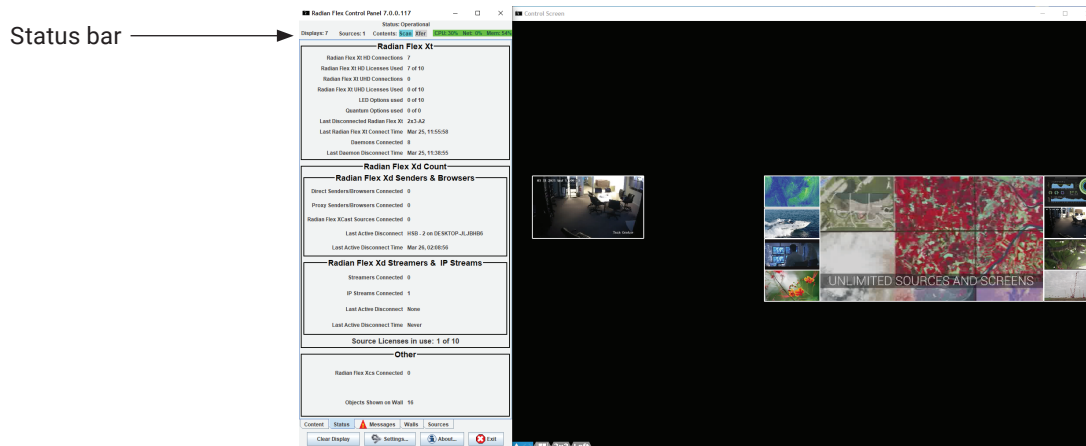
2.3 CONTROL SCREEN

The Control Screen shows the arrangement of all Radian Xt HD or Xt UHD Viewer computers and displays in your Radian Flex Software installation and the content that is on the Xt Viewer displays. The Control Screen works together with the Control Panel to control your Radian Flex Software system. The Control Screen has an intuitive User Interface. Use mouse clicks and drag to create, modify, or move content on the Control Screen and see changes on the wall in real time.

The arrangement of Radian Xt HD or Xt UHD Viewer displays on the Control Screen must match the physical arrangement of displays in your physical viewing location.

For Radian Flex Software Software systems with the Xv Layout capability, use the tabs and mini-map in the lower left corner of the Control Screen to select walls, zoom up on the displays, and navigate across your Radian Flex Software Software installation.

CHAPTER 2: QUICK START GUIDE
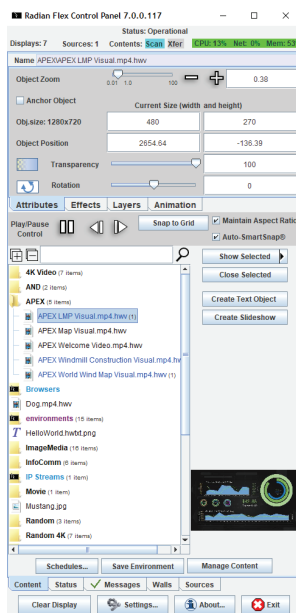
The Control Screen shows all walls. If there is content on the Xt HD or UHD Viewer displays, the Control Screen shows the content.

For systems with the Xv Layout capability, each wall has its own tab in the lower left of the Control Screen. Click the tab to center the wall on the Control Screen. Click the all-walls icon to show all walls.

2.4 ABOUT BUTTON

Click the About button on the Radian Flex Software to see a list of your Radian Flex Software licenses, Radian Flex software version number, the expiry date of your annual Radian Flex Software Maintenance Agreement, and more. See the graphic, below.

Software version number

About window

Expiration date

1. Click the About button on the Radian Flex Standard or Pro Controller to go to the About window

2. Look on the About window for a list of all your Radian Flex software licenses. If you need to modify your licenses, contact Black Box.

This Radian Flex Software User's Guide is a guide for Radian Flex Software. When you are using this guide, if you have a question about which Radian Flex Software is part of your system, click the About button to see your Radian Flex Software licenses.

CHAPTER 2: QUICK START GUIDE

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2.5 CONTENT TAB

Use the Content tab to import content and design, manage, and select content to show on your wall. See the graphic, below, for the main capabilities of the Content tab.

Attributes, Effects, Layers, Animation tabs

SmartFrame content to a grid on the Control Screen using button and checkboxes

Show Selected

Create Text Object

Schedules and Save Environment tabs

Manage Content button
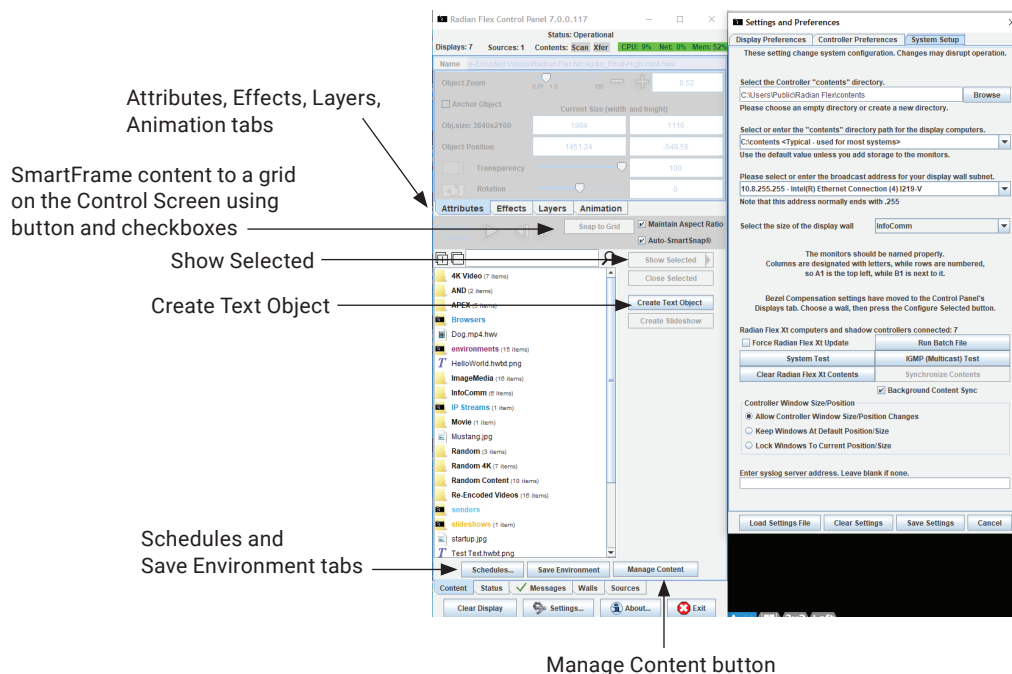
- SmartFrame content to a grid on the Control Screen using buttons and checkboxes.

- Tabs for graphic design – Attributes, Effects, Layers, Animation tabs.

- Change size of content, create special effects and animations, apply transparency and filters, and manage layers.

- Click Save Environment button to save a content arrangement for future use. To automate Radian Flex operation, click the Schedules button and schedule Environments to run.

- To open the Content tab, click the Content tab on Controller.

- Show Selected button shows content on Control Screen and wall. For Radian Flex systems with the Xv Layout capability, click on the right arrow (arrowhead) on the Show Selected button for options. There are several more options to show content on the Control Screen. Delete content from Control Screen with the Close Selected button.

- Create text with the Create Text Object button. Create a multimedia slideshow with the Create Slideshow button.

- Click Manage Content button to import stored content into Content List, delete and rename content, and more.

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CHAPTER 2: QUICK START GUIDE

2.6 STATUS TAB

See the Status tab for information about Xt Viewer and Xd Source connections, number of Standard or Pro Controllers and Xc Operators in use, number of content objects on your wall, and number of licenses validated. See the graphic, below.

Xt Viewer

Xd Source

Additional status

Click the Status tab on the Standard or Pro Controller
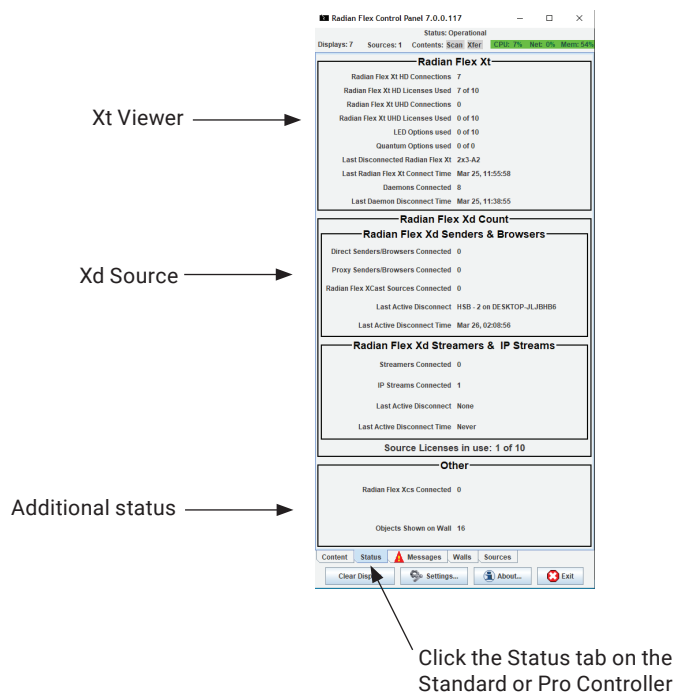
* Xt Viewer status: HD and UHD connections, licenses, disconnect and connect times, daemons connected, and time. The display count is in the Status bar, above.

* Xd Source status: Numbers of Browsers, Senders, Streamers, and IP Streams; Numbers connected, active disconnect, and time; Numbers of Source licenses in use.

Additional status:

* Xc Operators connected, number of objects on wall, licenses validated, number of Standard or Pro Controllers in use (FailSafe requires two Pro Controllers), number of content objects shown on wall.

Pro tip: Use the Objects Shown on Wall number in the Status tab to check for hidden or forgotten content on your wall.

CHAPTER 2: QUICK START GUIDE

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2.7 MESSAGES TAB

The Messages tab shows a log with status icons and alerts about your Radian Flex Software Software system. The Messages tab has information for your Radian Flex Software Software Administrators.

The Messages tab is designed for the Administrator of your Radian Flex Software Software system. The information in the Messages tab is useful to show the performance and actions of your Radian Flex Software system. The information can be saved in a tabbed format to sort and review in a spreadsheet.

NOTE: There is a red triangle alert icon on the tab of the Messages tab if there are urgent alerts in the log. Report an alert icon on the Messages tab to your Radian Flex Software Administrators. Opening the Messages tab removes the alert icon from the tab but does not resolve what is causing the alert message.

If your Radian Flex Software system has the Xa Access capability, the Messages tab also lists User actions in addition to system performance and actions. If your Xa Access is configured with logins for each individual User, the Messages tab lists User actions by User name. If your Xa Access is configured with an automatic log-in that does not require individual Users to identify themselves, User actions are grouped together in the Messages tab under one User name that the Administrators of your wall have created or selected for this purpose.

For Radian Flex Software systems with LED and the Radian Flex Sync software, the Messages tab shows the log for Radian Flex Sync if the logging option is selected in the Walls tab.
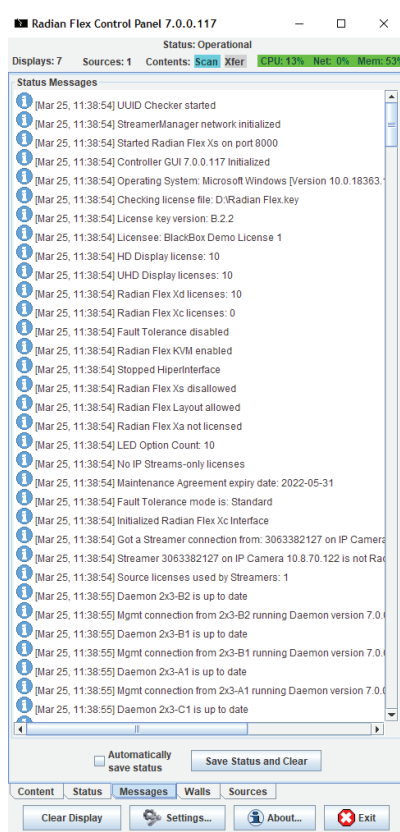
The Messages tab on the Radian Flex Controller shows Radian Flex system alerts and logs. The Messages tab shows an alert icon if there are alerts. Report alerts to your Radian Flex Administrator. The Messages tab is designed for Administrators.

2.8 WALLS TAB

New for Radian Flex Software Software 7, the Displays tab is now named the Walls tab, and has control buttons for the new Radian Flex Sync Option for LED. Use the Walls tab to see a list of your walls. Satellite displays are considered a wall. Click a Wall icon in the list on the Walls tab to see a list of Xt Viewer display computers in the wall. See the graphic, below.
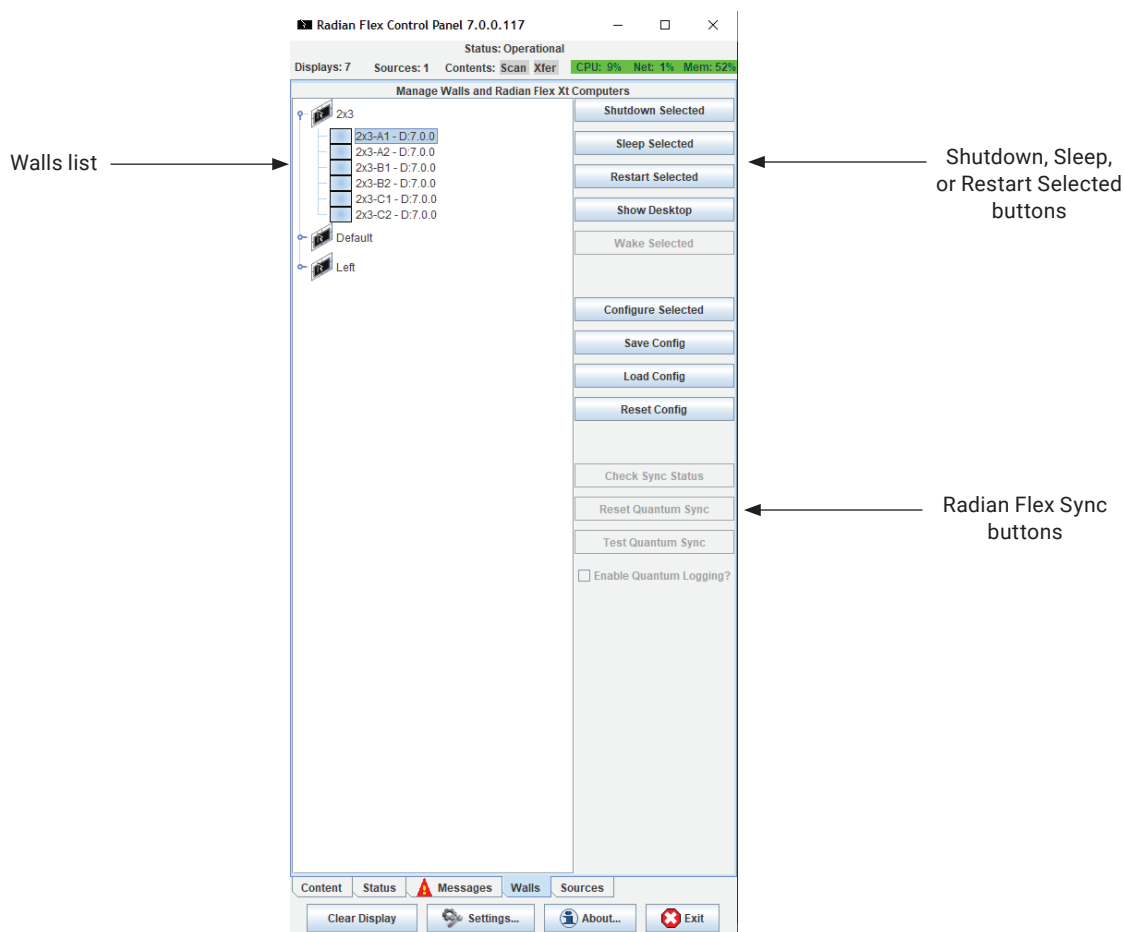
Most of the Walls tab functions are intended for your organization's Radian Flex Software Administrator.

Administrators use the buttons on the Walls tab to manage and configure displays and walls:

- For Users with LED walls with multiple controllers, tell your organization's Radian Flex Administrator if the LED sync seems misaligned. The Walls tab has buttons and a checkbox to use the Radian Flex Sync Option for Xt Viewer displays. The Radian Flex Sync Option is for LED walls with multiple LED controllers.

- For Users with LED walls, tell your organization's Radian Flex Software Administrator if images seem to be distorted on your wall. Check that the Xt Viewer LED Option is installed and configured correctly. The Xt Viewer LED Option uses the LED actual resolution to improve LED image quality for LEDs that have a difference between actual resolution and reported resolution.

- The position of content on your Control Screen should match the position of content on your wall. Tell your organization's Radian Flex Software Administrator if the appearance of a wall on your Control Screen and the wall do not match or seem misaligned. There are settings via the Walls tab to precisely configure your Walls tab and Control Screen to match your display resolution and the physical arrangement of your wall.

- The Walls tab has configuration settings to turn on Wall Grid and set up the SmartFrame grid.

- The Walls tab has configuration settings to select the color of the display tiles on the Control Screen.

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◆ Use buttons on the Walls tab to control Xt Viewer displays to wake, sleep, start, or shutdown. Or, use the Radian Flex Scheduler to schedule display operation.

◆ Click a Wall in the Walls List to show a list of Xt Viewer computers/displays in each wall. If displays do not have a wall name, the displays are in a wall with the name, Default Wall.

◆ The Walls tab buttons are intended for your organization's Radian Flex Administrator. There are buttons to manage and configure displays.

◆ Buttons for Radian Flex Sync realign the sync of LEDs that have multiple LED controllers.

◆ Configure Selected button configures walls and displays on Control Screen, Wall Grid SmartFrame, and tile colors on Control Screen.

2.9 SOURCES TAB

New for Radian Flex Software 7, configure, manage, and show your Radian Flex Software Xd Source content with the Sources tab on the Radian Flex.

The Radian Flex Software Xd Source family of content is Radian Flex Software Xd Source Browser, Streamer, IP Streams, and Sender.

Radian Flex Software Xd Source content delivers real-time awareness with live content from IP cameras and RTSP streams and specialized knowledge from streaming web pages, proprietary apps from Source computers, and information from devices with capture cards.

Your Radian Flex Software Xd Source content must be connected to the Radian Flex Software before using the Sources tab. For more about Radian Flex Software Xd Source and the Sources tab, see the Radian Flex Software Xd Source chapter.
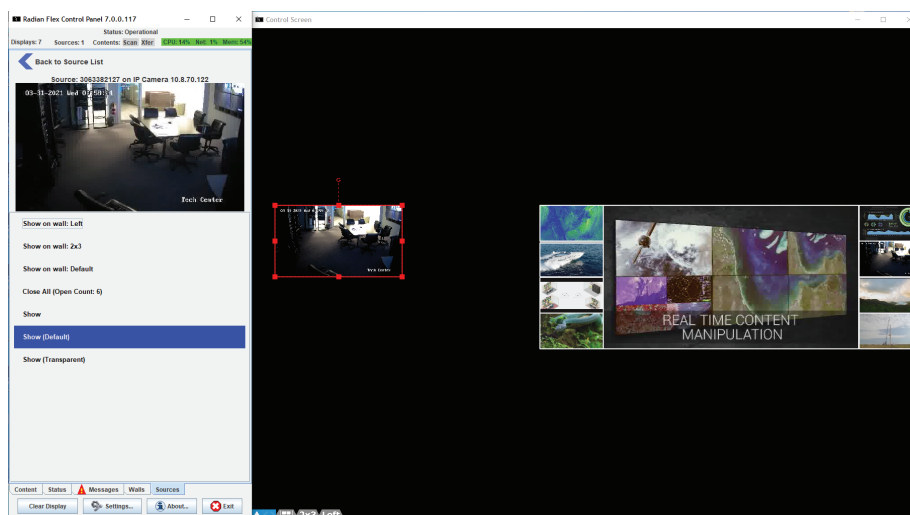
Click the Sources tab on the Radian Flex Software

The Sources tab shows the Source Apps List, a list of Radian Flex Xd Source apps connected to the Controller. Click a Source app to see a list of live feeds from that source and some options. Click a live feed for more details and options. For more about Radian Flex Xd Source software, see the Radian Flex Xd Source chapter.

◆ Source List – options change depending on Source

◆ Source Details – options change depending on Source

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2.10 XA ACCESS TAB

Manage and control access to the Radian Flex Software with Xa Access. Xa Access is included with Radian Flex Software Pro licenses and is an option for all other Radian Flex Software licenses. Configure Xa Access for individual Users to login and logout or allow auto-login. See the list and graphic, below.

If your Xa Access requires individual Users to login and logout:

◆ Click the Xa Access tab on the Radian Flex.

◆ To login, click the Login or Change User button. The list shows Users and Administrators logged in, times, and Radian Flex Software or Xc Operator location. The Messages tab on the Radian Flex Software logs User actions by User name.

◆ To logout, click the Logout or Change User button.

If your Xa Access has automatic login enabled, you will not need to login or logout. The Messages tab logs User actions under one User name.

Tabs and buttons on the Xa Access tab (not illustrated):

◆ Administrator button is for Xa Access Management

◆ Messages tab logs User actions by User name. If auto-login is enabled, actions are grouped under one User name.

◆ List of Users and Administrators logged-in, login locations, and times

Click the Login button to log into the Standard or Pro Controller. The Login button changes to the Change User button. To log out, click Logout button or Change User button.

If your Xa Access is set up with auto-login, there is no login or logout.

Click Xa Access tab on Controller to login, change User, or logout.

2.11 SETTINGS BUTTON

The Settings button on the Radian Flex Software shows many settings for the Radian Flex Software system.

Most of the settings are for your organization's Radian Flex Software Administrators. The Settings button is described here to explain the User Interface options that are available. The Settings button goes to tabs for Display Preferences, Controller Preferences, and System Preferences

Settings for the Radian Flex Software User Interface from the Settings button:

◆ For walls with bezels, there is a setting to manage the flow of pixels around the bezels in your Xt Viewer displays. Natural View allows pixels to flow smoothly across the bezels and is the way that most Users prefer their wall settings. If you see pixels that do not flow smoothly across the bezels, or if you need more of your image to be visible, talk with your Radian Flex Software Administrator about the settings for Natural View or Full View in the Display Preferences tab.

◆ There is a setting to have the cursor visible or hidden on the wall. The cursor is always visible on the the Control Screen. If you need the cursor visible on the wall for a presentation, or hidden to not be a distraction, the Cursor Mode setting is on the Display Preferences tab.

◆ If you need Display Grid SmartFrame, the Display Preferences tab has the settings to enable Display Grid SmartFrame and set up the display grid.

NOTE: There is also Wall Grid SmartFrame for Users with Xv Layout. For systems with display grids and wall grids, the wall grid takes priority.

◆ The default settings for maximum and minimum Object Zoom are 100.0/0.01. These settings work well for most Radian Flex Software Users. If your content is very small or very big, or if you are working on a very large wall, the settings on the Display Preferences tab may need to be adjusted for your application. Talk with your Radian Flex Software Administrator if you need to customize the Object Zoom settings.

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- The Controller Preferences tab has a setting for the Control Screen Magnifying Window. The magnifying window is designed to see under the cursor for Radian Flex Software Xd Source Sender/Streamer using KVM. If you are experiencing magnification under the cursor and do not need this magnification, or if you need magnification, talk with your Radian Flex Administrator about the settings for the Control Screen Magnifying Window.

- The System Setup tab has settings for the Controller Window Size/Position. This is the arrangement of the Control Panel and Control Screen on the Radian Flex Software. Most Users have the Control Panel and Control Screen next to each other for easy access to both. The position of the Control Panel and Control Screen impact all Radian Flex Software Users. Talk with your Radian Flex Software Administrator if you would like to make a change to this setting.
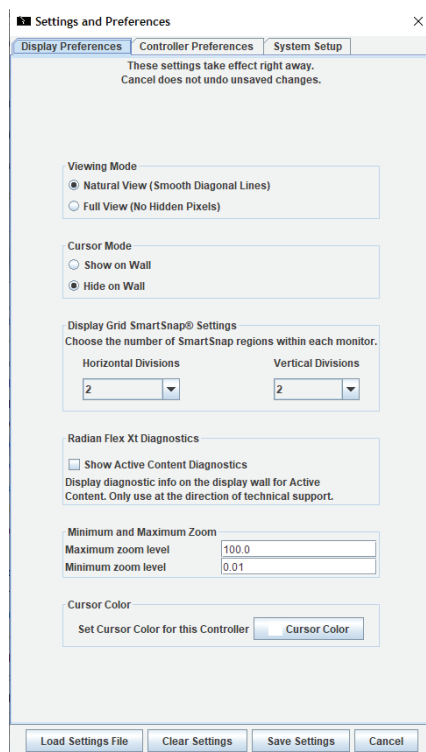
The Settings button on the Controller goes to three Settings tabs for Radian Flex Administrators: Display Preferences tab, Controller Preferences tab, and System Setup tab.

Options include:

- Viewing Mode (usually Natural View)
- Cursor Mode
- Display Grid SmartFrame (Max/Min Zoom – default settin of 100.0/0.01 is usually fine)
- Cursor Color
- Control Screen
- Magnifying Window – designed for Xd Source
- Sender/Streamer using Xd Source
- Controller Window Site/Position

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2.12 EXIT BUTTON

Click the Exit button on the Radian Flex Software for five Exit options: Quit Radian Flex, Shutdown Display Wall, Restart Radian Flex, Sleep displays, and Quit this Controller only. Find out from your organization's Radian Flex Software Administrator which Exit option to use in your organization.
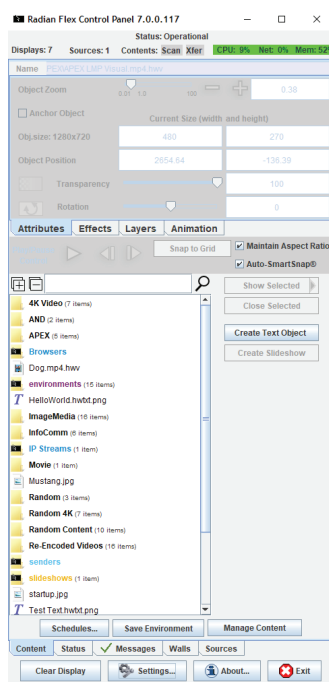
Or, click the close box on the top right corner of Control Panel on the Radian Flex Controller. This brings up the Exit Choice menu.

Click the Exit button 1 on the Radian Flex Controller.

2. Scroll and click your Exit option on the Exit Choice menu

2.13 CLEAR DISPLAY BUTTON

Click the Clear Display button on the Radian Flex Software to remove content from all walls. A satellite display is considered a wall. See the graphic, next.

If you only need to remove a few content objects from the wall, consider using the Close Selected button on the Content tab, or press the delete key.

If you need to reuse the content arrangement in the future, save the content arrangement as a Radian Flex Software Environment before you clear the wall. When you need the content arrangement again, show the Environment on the wall. Use the Save Environment button on the Content tab.

Click the Clear Display button on the Radian Flex Controller to remove all content from all walls. If you do not need to delete all content, use the Close Selected button on the Content tab or the Delete key.

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3. HARDWARE AND LICENSE REQUIREMENTS

Exhibit high resolution content, even gigapixel content, at more than one billion pixels and stream 4K video – all with Radian Flex software running on commodity, off-the-shelf hardware. Radian Flex is a software-based solution that is hardware agnostic, giving you the flexibility to select hardware tailored to your application and budget requirements.

This chapter will help you specify the computing and network hardware and the Radian Flex software to efficiently and powerfully support your plans for your Radian Flex video wall and distributed visualization system.

Black Box Technical Support (877-877-2269 or techsupport@blackbox.com) is a resource to answer your questions and provide advice for designing and planning your Radian Flex System. In addition, discuss with the Technical Support team how a Radian Flex Software Maintenance Agreement expedites answers to questions and keeps your Radian Flex System continuously updated with the latest software improvements.

3.1 DESIGNING AND PLANNING YOUR RADIAN FLEX SYSTEM

Designing and planning your Radian Flex video wall and distributed visualization system – either from scratch or updating an existing system – involves several steps:

1. Identify the types of content you plan to show and interact with on your Radian Flex video wall and distributed visualization system.

2. Select the Radian Flex software suites and options that will help you achieve your goals for your Radian Flex experience.

3. Select the hardware that works best for each software component based on your plans for content. When planning the physical installation, also review and make any necessary upgrades to power circuits and cooling equipment for your computing, network, and viewing spaces.

4. Arrange a Radian Flex Software Maintenance Agreement to keep your Radian Flex System updated and expedite support.

Throughout the design and planning process, please consult with the Black Box Technical Support team at 877-877-2269 or techsupport@blackbox.com for expert advice and answers to questions based on our experience with many types of Radian Flex installations.

3.2 OVERVIEW OF RADIAN FLEX SOFTWARE AND LICENSES

Customize your Radian Flex System for your organization's unique needs and requirements. The next table provides an overview of the Radian Flex software suites, options, licenses, and quantities. Review the table, consult tech support for expert advice and answers to your questions, and select the Radian Flex software suite and options for your organization.

Consult the Black Box Technical Support team for advice on planning a new system or upgrading an existing system.

CHAPTER 3: HARDWARE AND LICENSE REQUIREMENTS

3.2.1 CONTROLLING YOUR RADIAN FLEX SYSTEM

TABLE 2-1. RADIAN OPTIONS AND FEATURES

COMPONENT	RADIAN FLEX PRO	RADIAN FLEX STANDARD
Radian Flex Controller Software: Requires a Radian Flex USB license in the Controller computer. The Radian Flex Controller Software and User Interface provides access and control of your Radian Flex System. The software includes the Control Panel, Control Screen, and many resources for importing, delivering, and creating content to show and interact with on your Radian Xt UHD or HD Viewer displays	Included in Radian Flex Pro	Included in Radian Flex Standard
Additional Radian Flex Controller Software for Fault Tolerance: Add a second Radian Flex USB license for the second Controller. With fault tolerance, automatically recover from many situations if a Controller's operation is disrupted	Included in Radian Flex Pro	Not available
Key Node Software to enable Fault Tolerance: Requires a Radian Flex USB license in the Key Node computer.	Included in Radian Flex Pro	Not available
Radian Xc — ControlBridge Operator Software: Quantity of 1 per running instance of Radian Xc — ControlBridge Operator software. Use Radian Xc's basic, intuitive user interface to control your Radian Flex System from computers in additional locations.	Optional (as many as required)	Optional (as many as required)
Radian Flex Cast —Source Remote Broadcasting Software: One license per Radian Flex Cast connection and requires a Radian Flex USB license in the Radian Flex Cast —Source Remote Broadcasting Computer. Radian Flex Cast allows sharing content between distant Radian Flex systems.	Optional (as many as required)	Optional (as many as required)

3.2.2 INPUTTING CONTENT WITH RADIAN XD SOFTWARE

TABLE 2-2. INPUTTING CONTENT WITH RADIAN XD SOFTWARE

RADIAN FLEX SOFTWARE	RADIAN FLEX PRO	RADIAN FLEX STANDARD
Radian Xd Sender, Streamer, and IP Streams Software: One Radian Xd license per Radian Xd stream. Use Radian Xd for live content – sending desktop capture windows and streaming movies, video, and IP cameras.	Optional (as many as required)	Optional (as many as required)

CHAPTER 3: HARDWARE AND LICENSE REQUIREMENTS

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3.2.3 VIEWING CONTENT WITH RADIAN XT UHD OR HD VIEWER SOFTWARE

TABLE 2-3. VIEWING CONTENT WITH RADIAN XT UHD OR HD VIEWER SOFTWARE

RADIAN FLEX SOFTWARE	RADIAN FLEX PRO	RADIAN FLEX STANDARD
Radian Xt HD Viewer Software: One license per HD display in the video wall and satellite monitors.	Required (one per HD display)	Required (one per HD display) in Radian Flex Standard
Radian Xt UHD Viewer Software: One license per UHD display (larger than 1920 x 1080) in the video wall and satellite monitors.	Required (one per UHD display)	Required (one per UHD display)

3.2.4 CUSTOMIZE YOUR RADIAN FLEX SYSTEM WITH PREMIUM FEATURES

TABLE 2-4. PREMIUM FEATURES

RADIAN FLEX SOFTWARE	RADIAN FLEX PRO	RADIAN FLEX STANDARD
Radian Flex Xa Capability: Radian Flex Xa provides user authentication (login), tracking of user activities (logging), and choosing which actions users can perform (permission checking). Set up Radian Flex Xa to require each user to login or, alternatively, set up an automatic login that does not require individual users to login.	Included	Optional
Layout Control Capability: Move beyond a standard grid with the Layout Control Capability to design custom, artistic configurations for your Radian Flex video walls and satellite monitors.	Included	Optional
Radian Xv Layout: Supports multiple video walls from a single system.	Included	Optional
Radian Xs Capability: With Radian Xs, use the keyboard, monitor, and mouse on the Controller computer to more easily control a distant Radian Xd Sender or Streamer computer for desktop capture or a Radian Xc — ControlBridge Operator computer	Included	Optional
Radian Flex Xs Services API Control License Capability (External Interface): Use Radian Flex Xs Services API Control License to program networked devices and software to interact with content and control your Radian Flex System.	Included	Optional

3.2.5 DESIGNING AND UPGRADING YOUR RADIAN FLEX SYSTEM

It is important to use computers and install network equipment that meets the performance required for the content you plan to use on your Radian Flex System.

Each hardware component in the Radian Flex network contributes to visual information processing. Every time a computer running Radian Flex software is added to the Radian Flex network, it not only adds a new content source or destination, but it also adds more processing power. As a result, the total processing power of the Radian Flex System automatically increases as the number of components increases. This helps ensure that large walls do not outgrow the processing capabilities of the complete Radian Flex System and ensures that you can expand your Radian Flex System over time to meet your needs.

The Radian Flex hardware requirements provided in this chapter are divided into three levels: Minimum, Recommended, and 4K Configuration.

1. Minimum specifications are the minimum necessary for Radian Flex software to function. The minimum specs may or may not meet your needs.

2. Recommended specifications represent a typical Radian Flex System with HD video playback up to 1080p.

To learn more about designing a Radian Flex video wall or distributed visualization system tailored to your needs, or to bring your existing Radian Flex System up to the current software release and hardware capability, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com

Radian Flex also offers a Software Maintenance Agreement to keep your Radian Flex software current and expedite support. Whether it's new display technology, faster CPU and memory, or a bigger display wall, upgrade your hardware and Radian Flex software over time to adapt to your changing needs and future technology.

3.3 CONTROLLING CONTENT: HARDWARE REQUIREMENTS

3.3.1 CONTROLLER SOFTWARE

The Radian Flex Controller Software and User Interface provides access and control of your Radian Flex System. The software includes the Control Panel, Control Screen, and many resources for importing, delivering, and creating content to show and interact with on your Radian Xt UHD or HD Viewer displays.

The Radian Flex Pro can have two Controller computers for fault- tolerant operations. If there is a disruption to one Controller's operation, the second Controller provides continuous operation of the Radian Flex System. The Radian Flex Standard has one Controller computer. Each Controller computer must have a Radian Flex license installed in a USB port.

- OS: Windows 7 or later, 64 bit
- Ethernet: Gigabit
- Minimum: CPU: Dual core 2 GHz, 4 GB RAM; GPU: NVIDIA® x40, AMD® HD3xxx, or Intel® HD2000
- Recommended: CPU: Intel fourth-generation (Haswell) or newer i5, 2.5 GHz or better, 8 GB dual channel RAM; GPU: NVIDIA GTX1050
- Monitor and graphics adapter: Vertical resolution of at least 900 pixels; wide format display is recommended; 1920x1080 pixels or larger preferred.
- Storage: At least 20 GB free storage plus more for stored content
- If your content involves lots of movie playing, the Controller computer should be a very powerful (quad core or better) machine.

3.3.2 KEY NODE SOFTWARE

The Key Node software is for Radian Flex Pro with fault tolerant operations. The Key Node software runs on a separate computer and works together with the two Controllers. The Key Node computer must have a Radian Flex license installed in a USB port.

- OS: Windows 7 or later
- Ethernet: Gigabit
- Minimum: CPU: Dual core 2 GHz or faster, 2 GB RAM; GPU: Discrete or embedded graphics controller required.
- Recommended: CPU: Quad core, 2 GHz or faster
- Graphics controller: Discrete or embedded graphics controller required.
- Monitor and graphics adapter: Vertical resolution of at least 800 pixels.

CHAPTER 3: HARDWARE AND LICENSE REQUIREMENTS

3.3.3 RADIAN XC — CONTROLBRIDGE OPERATOR SOFTWARE

Radian Xc — ControlBridge Operator software provides remote access from one or more work stations anywhere in the world. Radian Xc — ControlBridge Operator has a simplified interface designed for basic functions, allowing you to continue to control your video wall, provide support, and manage the look and feel of your video wall when away from your Controller computers.

◆ OS: Windows 7 or later, OSX with Java 1.8 or later, or Linux with Java 1.8 or later

◆ Minimum: CPU: Dual core, 2 GB RAM; Ethernet: 100 Mb or 802.11N (or better) wireless

◆ Recommended: CPU Dual core or more cores, 2.5 GHz or better, 4 GB RAM; Ethernet: 1 Gbps or 802.11N wireless

3.3.4 RADIAN FLEX CAST — SOURCE REMOTE BROADCASTING SOFTWARE

Radian Flex Cast —Source Remote Broadcasting software is an option to share content with multiple connected Radian Flex Systems. Use Radian Flex Cast —Source Remote Broadcasting to share slide shows, animations, and environments. Also share live video feeds, data files, and stored video and images.

◆ OS: Windows 7 or later

◆ Ethernet: Gigabit

◆ Minimum: CPU: Dual core 2 GHz, 4 GB RAM GPU: NVIDIA x30 or Intel HD2000

◆ Recommended: CPU: Intel i5 2.5 GHz, 8 GB dual channel RAM; GPU: Discrete or embedded graphics controller required.

3.4 INPUTTING CONTENT WITH RADIAN XD SOFTWARE: HARDWARE REQUIREMENTS

Radian Xd software delivers live, just-in-time content to your Radian Flex video wall and distributed visualization system. Radian Xd software has three software components – Sender, Streamer, and IP Streams. Please discuss your plans with Black Box Technical Support at 877-877-2269 or info@blackbox.com to develop computer configurations tailored to your needs.

3.4.1 SENDER

Radian Xd Sender software allows you to show data from nearly any application on the display wall, including screen capture, from one or more Sender computers.

◆ OS: Windows 7 or later, OSX with Java 1.8 or later, or Linux with Java 1.8 or later. Virtual machine environments may be used.

◆ Ethernet: 100 Mb or 802.11N wireless

◆ Minimum: CPU: Dual core, 2 GB RAM

◆ Recommended: CPU: Dual core, 2.5 GHz, 4 GB RAM

3.4.2 STREAMER

Radian Xd Streamer software is for fast-moving video content, input from DirectShow-compliant capture devices and attached cameras, and high frame rate desktop capture – such as movies – streaming to the display wall. The Streamer offers very high quality streaming and significantly reduced bandwidth. Most settings and options are per-stream.

◆ OS: Windows 7 or later, 64-bit.

◆ Ethernet: Gigabit

◆ Minimum: CPU: Dual core 2 GHz, 4 GB RAM GPU: NVIDIA x30 or Intel HD4600

⬥ Recommended: CPU: Intel fourth-generation (Haswell) or newer i5, 2.5 GHz or better, 8 GB dual channel RAM; GPU: NVIDIA GTX1050

3.4.3 IP STREAMS

Radian Xd IP Streams software delivers IP cameras and Real Time Streaming Protocol (RTSP) sources from over the Internet or the LAN to your Radian Flex System. IP Streams supports H.264 and MJPEG formats and the ONVIF global open standard for IP security products.

⬥ OS: Windows 7 or later, 64 bit, with .NET 4.6.1

⬥ Ethernet: 1 Gbps

⬥ Recommended: CPU: Intel fifth-generation (Broadwell) or newer i7, 3.3 GHz or better, 16GB or more of main memory; GPU: HD Graphics 6000

3.5 VIEWING CONTENT WITH XT UHD OR HD VIEWER SOFTWARE: HARDWARE REQUIREMENTS

The Radian Xt UHD or HD Viewer computers can be embedded in the monitor or connected to the monitor by a VGA, DVI, DisplayPort, or HDMI cable.

⬥ OS: Windows 7, 8.1, or later

⬥ Ethernet: Gigabit

⬥ Minimum: CPU: Dual core 2 GHz or faster, 2 GB RAM; GPU: NVIDIA x40, AMD HD3xxx or Intel HD2000

⬥ Recommended: CPU: Intel fourth-generation (Haswell) or newer i5, 2.5 GHz or better, 4 GB dual channel RAM; GPU: Intel HD 4600 or NVIDIA GTX1050 (or better).

⬥ Storage: At least 20 GB free storage plus more for stored content

3.6 RADIAN FLEX NETWORK REQUIREMENTS

The switch for the Radian Flex LAN must be configured for IGMP. The Black Box Technical Support Team can provide advice on the appropriate network equipment for your Radian Flex System based on your organization's unique needs and requirements. Discuss your plans for your Radian Flex System with the Black Box Technical Support Team at 877-877-2269 or info@blackbox.com.

⬥ Non-blocking Gigabit Ethernet (all ports run at full wire speed with no packet loss).

⬥ The gigabit Ethernet switch should support IGMP Snooping, IGMP Querier, and IGMP Immediate-Leave (Fast-Leave).

⬥ If using multiple switches, use an inter-switch (stacking) link.

⬥ Managed Layer 2 switch

⬥ Dedicated switch or a dedicated VLAN if VLANs are in use.

⬥ Controller computers, Key Node computer, Radian Xt UHD or HD Viewer computers, and computers for Radian Xd Senders and IP Streams must be on the same subnet. It is acceptable to use two (or more) NICs to connect to multiple networks if needed.

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3.7 POWER AND COOLING REQUIREMENTS

During the planning phase, calculate the total amount of power you need for the Controller computers, Radian Xt UHD or HD Viewer monitors and computers (external or embedded in the monitor) – and all other computers and network equipment for your Radian Flex System.

Calculate the cooling requirements for your equipment as well as for the space where your Radian Flex is installed and the space where people will be viewing and interacting with the content on the video wall.

CAUTION: Make sure that you do not exceed the power limits of any individual power circuit. Depending on the size of your video wall and distributed visualization system, you may need multiple power circuits to supply the total amount of power needed for your computer hardware and viewing area. You may also need plenty of cooling to prevent the monitors and computers from overheating and failing. Uninterruptable power supplies may help protect equipment if power outages are a concern.

CHAPTER 4: INSTALLING AND UPDATING THE SOFTWARE

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4. INSTALLING AND UPDATING THE SOFTWARE

Installing and configuring your Radian Flex software is the key step that takes you from planning your Radian Flex System to making it a reality.

Chapter 2 discussed hardware requirements. This chapter, Chapter 3, reviews three main elements of a successful Radian Flex software installation or update:

1. Planning – Preparing the hardware and the computing environment and planning for the work ahead.

2. Installing and configuring the network and Radian Flex software.

3. Running the IGMP Multicast Test, reviewing the results with the Black Box Technical Support Team at 877-877-2269 or info@blackbox.com, and making any adjustments to software settings and preferences.

Each Radian Flex System reflects the unique requirements of the customer. Radian Flex software can run on a variety of commodity, off-the-shelf hardware. In addition, Radian Flex software offers many options for settings and preferences, allowing a great deal of power and flexibility in how to deliver and interact with content on your Radian Xt UHD or HD Viewer displays.

Black Box Technical Support has experience with many Radian Flex installations and updates. They can answer questions and assist you with configuring your system for your requirements – techsupport@blackbox.com.

4.1 PREPARING TO INSTALL THE RADIAN FLEX SOFTWARE SUITES

1. Check that each PC has the correct hardware and operating system installed for each Radian Flex software component. Also see Chapter 2.

2. Check that all graphics drivers are fully up-to-date by downloading them from the GPU vendor's website and installing them. Do not install Microsoft Remote Desktop Protocol.

3. Check that all the PCs are in good working order with a standard burn-in test successfully completed on each PC.

4. Check that all monitors are operational and in good working order.

5. Check that power and cooling requirements for Radian Flex computers, displays, and network equipment, as well as in the Radian Flex viewing area, have been evaluated and, if necessary, power circuits and HVAC have been improved. See Chapter 2, Power and Cooling Requirements.

6. Check that the required number of Radian Flex USB software licenses are on site. Each USB drive contains the Radian Flex software license and must be inserted into the correct computer for the Radian Flex System to run. The Radian Flex software will report an error if a USB license is missing. Plan which USB port to use to prevent removal or damage.

7. For planning purposes, the following Radian Flex components are typically the most time and resource intensive during the software configuration processes:

- Configuration of the Radian Flex switch for IGMP.

- Radian Xt UHD or HD Viewer software is quick to install, but must be installed on each display computer.

- Software installation and configuration of the computers for the Radian Flex Controllers, Radian Xd Streamer and Radian Xd IP Streams, and Radian Flex Cast —Source Remote Broadcasting.

- After the network has been configured and Radian Flex software has been installed, run the IGMP Multicast Test, coordinate with the Black Box Technical Support Team after the test, and perform any resulting adjustments.

4.2 INSTALLING THE RADIAN FLEX SOFTWARE

Review the recommendations in "Preparing to Install the Radian Flex Software Suites."

CHAPTER 4: INSTALLING AND UPDATING THE SOFTWARE

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4.2.1 CONFIGURING THE RADIAN FLEX NETWORK

Radian Flex software uses unicast, multicast, and broadcast protocols. Configuring the switch correctly for Radian Flex software is an important step in the installation process.

Black Box Technical Support can recommend switches and can also give you details on configuring your particular switch for Radian Flex software. Contact the team at 877-877-2269 or info@blackbox.com

1. Configure a DHCP server, if needed.

◆ Static IP addresses are recommended for most computers running Radian Flex software. Static IP addresses will prevent possible interruptions when DHCP addresses are re-acquired.

◆ Non-static IP addresses are recommended only for transient or temporary Radian Xd and Radian Xc — ControlBridge Operator computers.

2. Fully enable IGMP Version 3.

◆ Configure the switch to enable IGMP snooping and IGMP querier.

◆ Some switches have a setting to drop unregistered or unknown multicast packets: enable this setting.

◆ Enable "immediate leave" or "fast leave" for the VLAN that connects the Radian Flex System.

◆ Turn OFF broadcast/packet storm protection, if any.

3. Optionally connect the Radian Flex switch to a gigabit router. You can optionally use a router to provide DHCP services and let your Radian Flex System access a corporate backbone or the Internet. Routers provide DHCP services to transient or temporary Radian Xd and Radian Xc — ControlBridge Operator computers.

4.2.2 INSTALLING RADIAN XT UHD OR HD VIEWER SOFTWARE

1. Name the Radian Xt UHD or HD Viewer computers.

◆ Connect a keyboard and mouse to each Radian Xt UHD or HD Viewer computer or use a remote desktop utility to perform the entire operation from a single PC, such as the Controller computer.

◆ For standard grids, use the A1, A2 naming scheme like for a spreadsheet (recommended). Column names start at the upper left with A, and increase the letter by one for each additional column to the right. Row names start at the upper left with 1, and increase the number by one for each additional row going down. Note that Radian Flex systems without the Layout option require this naming scheme.

◆ An example wall that is three monitors high and four monitors wide is shown below.

FIGURE 4-1. EXAMPLE VIDEO WALL

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◆ For recommended naming schemes for custom configurations created with Layout Control, such as multiple video walls or displays in artistic arrangements, including mixing portrait and landscape displays, contact the Black Box Technical Support team at 877-877-2269 or info@blackbox.com. Figure 4-2, below, shows a custom configuration created with Layout Control. The Layout Control capability is included with the Radian Flex Pro and is an option for the Radian Flex Standard.
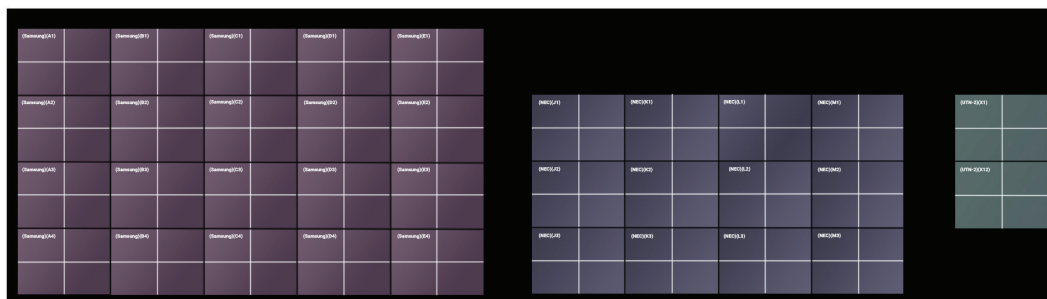
FIGURE 4-2. CUSTOM CONFIGURATION

2. Set static IP address on each Radian Xt UHD or HD Viewer computer (recommended).

3. Install VNC Client (recommended).

◆ Install VNC Client before anything else to enable remote control, simplifying installing everything else. A VNC (Virtual Network Computing) client on the Radian Xt UHD or HD Viewer computers, and VNC server on Controller computers, allows networked control over the Radian Xt UHD or HD Viewer machines. This greatly aids troubleshooting and maintenance.

◆ Radian Flex works with VNC software from TightVNC, www.tightvnc.com/download.php, UltraVNC and RealVNC. Do not use VNC software that changes the Radian Flex display environment. We do not recommend products like LogMeIn or GoToMyPC because of their changes to the display environment.

◆ Disable automatic updates, if possible, to prevent update messages from appearing.

◆ Do not use Microsoft's Remote Desktop Protocol. Some versions of Microsoft RDP prevent Radian Xt UHD or HD Viewer software (and many other graphical applications) from working.

4. (Optional) Install Google Earth® on each Radian Xt UHD or HD Viewer computer to use the entire wall as a high resolution, large format Google Earth display system. Note that Google no longer supports the interface Radian Flex software uses to control Google Earth, so this functionality may be eliminated by future Google updates.

5. Connect Radian Xt UHD or HD Viewer computers to the Radian Flex network.

◆ If your monitors include embedded PCs, then each monitor only requires an Ethernet cable and a power cable. Connect each Ethernet cable to the gigabit switch.

◆ If your monitors do not have embedded computers, then each monitor has a computer that requires a power cord and VGA, DVI, Display Port, or HDMI cable. Connect the cable of each monitor to the external PC that will control that monitor and then connect each computer to the gigabit switch.

◆ Some systems have overscan settings when using an HDMI connection. Disabling the overscan is appropriate for most Radian Xt UHD or HD Viewer computer/monitor combinations.

6. Enable the Radian Xt UHD or HD Viewer monitor to wake up automatically from sleep under the control of Radian Flex software.

◆ In the Windows Device Manager, open the properties pane for the GigE network device.

◆ In the Power Management tab, select, "Allow this device to wake the computer," to enable waking up from sleep under Radian Flex control. If there is an option to wake the computer from Standby, make sure it is selected.

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- In the Advanced tab, configure Wake-On-LAN to wake up upon "Magic Packet." Note that some PCs may require Wake-On-LAN to be enabled in the BIOS before full functionality is available. If this is the case for your computer, contact the computer manufacturer for more information.

- In the Power Options Control Panel, make sure password is NOT required on wake.

7. Install Radian Xt UHD or HD Viewer software on each Radian Xt UHD or HD Viewer computer.

- Run Radian Xt UHD or HD Viewer Setup.exe.

- If your Radian Xt UHD or HD Viewer computers are monitors with an embedded computer and hard drive, you may need to install the Radian Xt UHD or HD Viewer software on the D drive on the monitor. If your computer does not have a D drive, then this probably does not apply to you.

8. The Radian Xt UHD or HD Viewer software will automatically reboot each Radian Xt UHD or HD Viewer monitor/computer. Check that all Radian Xt UHD or HD Viewer monitors/computers have rebooted.

9. Confirm that each Radian Xt UHD or HD Viewer PC is connected to the switch at 1 Gbps speed.

4.2.3 INSTALLING KEY NODE SOFTWARE

The Key Node software is for Radian Flex Pro with fault tolerance.

1. Set static IP address (recommended).

2. Connect the Key Node computer to the Radian Flex network.

3. Run Radian Flex Key Node Setup.exe.

4. The Radian Flex Key Node software requires a Radian Flex USB flash drive to be inserted into the computer.

- There is one Radian Flex USB software license for the Key Node computer. The Key Node is only used for the Radian Flex Pro with fault tolerance.

- The USB drive has the software license and must be inserted into the correct computer for the Radian Flex System to run. The Radian Flex software will report an error if a license is missing.

- Please consider physical drive size and port location on the computer to prevent damage or accidental removal.

5. Reboot the Key Node PC.

6. Confirm that the Key Node PC is connected to the switch at 1 Gbps speed.

4.2.4 INSTALLING THE CONTROLLER SOFTWARE

1. Set the static IP address on Controller computer (recommended). Refer to your Radian Flex license agreement for the number of Controller computers.

2. Connect the Controller computer to the Radian Flex network.

3. Install VNC Server (recommended). Radian Flex works with VNC software from TightVNC, www.tightvnc.com/download.php, UltraVNC and RealVNC. Do not use VNC software that changes the display environment. We do not recommend products like LogMeIn or GoToMyPC because of their changes to the display environment. Contact the Black Box Technical Support Team for more information.

4. Run Radian Flex Controller Setup.exe.

5. The Radian Flex Controller software requires a Radian Flex USB flash drive to be inserted into each Controller computer.

- There is one USB Radian Flex software license for each Controller computer.

- The Radian Flex Pro with fault tolerance has two Controller computers and two USB Radian Flex software licenses. The Radian Flex Standard has one Controller computer and one USB Radian Flex software license.

- Please consider physical drive size and port location on the computer to prevent damage or accidental removal.

6. Reboot the Controller PC.

7. Confirm that the Controller PC is connected to the switch at 1 Gbps speed.

8. Set up the Controller software with the initial settings.

The first time you run the Controller software, the software brings up the System Setup window and prompts for initial settings. Fill in the information. Review Figure 4-3 and settings information, below.

FIGURE 4-3. SETTINGS AND PREFERENCES SCREEN

◆ Load settings file: Saving Settings automatically creates a backup of the settings as a file in the same folder as the "contents" directory. If you have this file from another computer, you can load it with the Load Settings File button.

◆ Select the "contents" directory for all display content: Specify where content is stored on the Controller. The default is to store it in a new folder called "contents" on the Controller.

◆ Select or enter the "contents" directory to be used on the monitors: Use this to control where all content is stored on the Radian Xt UHD or HD Viewer computers. The default is to store it in a new folder called "contents" in the root of the C drive on each Radian Xt UHD or HD Viewer computer.

◆ Select or enter the broadcast address for your display wall subnet: The IP address for broadcast communications between the Radian Flex computers. The first three positions are usually the same as the first three positions of the IP address of the Controller computer. The last position is usually 255 to comply with IP broadcast standards. Subnets larger than Class C may be permitted with an appropriate broadcast address entry.

◆ Select the size of the display wall: For Radian Flex Standard, key in the number of monitors across. For Radian Flex Pro, select the entry in the list that matches the width and height (in number of monitors) of your wall. This selects a matching configuration file that maps the monitor positions. Contact technical support if your wall is larger than the listed options or if you require a custom configuration using Radian Flex Layout Control capability. See Chapters 1 and 2 for more about Layout Control.

NOTE: The Bezel Compensation settings are on the Displays Tab of the Control Panel, see Chapter 9.

9. Click Save Settings. Your Controller computer will now find your Radian Xt UHD or HD Viewer computers (see the earlier installation step for installing Radian Xt UHD or HD Viewer software). Your Control Panel is now ready to use.

10. After you specify the initial settings in the System Setup tab, you can change them, if needed. There is more about the System Setup tab later in this chapter with the IGMP Multicast Test and in Chapter 9.

4.2.5 CONFIGURING RADIAN FLEX XA SOFTWARE

1. Radian Flex Xa is the Radian Flex permissions system. Radian Flex Xa comes with the Radian Flex Pro and is an option for the Radian Flex Standard. If your Radian Flex System has Radian Flex Xa, once the Radian Flex system setup settings are saved, the Controller initializes and presents a window asking to initialize the Radian Flex Xa Management System.

2. After clicking OK, the Radian Flex Xa software presents a New User window – this is how the first administrator user is added. Radian Flex Xa needs at least one administrator user in order to function.

3. Turn to Chapter 10, Initial Radian Flex Xa Configuration for installation and configuration instructions.

4.2.6 INSTALLING THE CONTROLLER SOFTWARE ON THE SECOND CONTROLLER

1. For Radian Flex Pro with fault tolerance: Repeat software installation for the second Controller computer and update settings.

The second Controller will automatically pick up some settings from the first Controller computer. Review the System Setup window and enter in settings as needed.

Many settings are shared between the two Controller computers in the Radian Flex Pro. Changing a setting on one Controller computer will propagate the change to the other one.

◆ Examples include the contents location on the Radian Xt UHD or HD Viewer computers, as well as visible settings such as the SmartFrame grid and natural vs. full view mode.

◆ Other settings that are specific to a particular Controller, such as the local contents directory location, diagnostic telemetry display, or cursor color, are private and not shared with the other Controller.

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2. If a custom config file is needed for an advanced wall configuration, that file must be manually copied to both Controller computers, because the Controller software does not have permission to modify files in the Windows Program Files directory where the config files reside. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.cm

4.2.7 INSTALLING RADIAN XD SENDER SOFTWARE

1. Set static IP address for local, permanent Sender computers (recommended). Dynamic IP (DHCP) may be used for temporary or remote Senders.

2. Name the PC with an appropriate, meaningful name (for example, Sender1).

3. Connect the Sender computer to the Radian Flex network.

4. Run Radian Xd Sender Setup.exe.

5. Copy Sender shortcut to startup folder if desired to automatically start Sender software after each boot.

6. See Chapter 6, the Radian Xd chapter, for how to set up and optimize Sender feeds.

4.2.8 INSTALLING RADIAN XD STREAMER SOFTWARE

1. Set static IP address (recommended). Dynamic IP (DHCP) may be used for temporary or remote Senders.

2. Name the PC with an appropriate, meaningful name (for example, Streamer1).

3. Connect the Streamer computer to the Radian Flex network.

4. Run Radian Xd Streamer Setup.exe.

5. Reboot each Streamer PC.

6. Confirm that each Streamer PC is connected to the switch at 1 Gbps speed.

7. The Streamer software has the ability to create a new shortcut that will launch the Streamer software and immediately start streaming to the Radian Flex. Copy this shortcut to the Windows startup folder to automatically start streaming after Windows login.

8. See Chapter 6, the Radian Xd chapter, for how to set up and optimize Streamer feeds.

4.2.9 INSTALLING RADIAN XD IP STREAMS SOFTWARE

1. Set static IP address (recommended). Dynamic IP (DHCP) may be used for temporary or remote IP streams.

2. Name the IP Streams PC with an appropriate, meaningful name (for example, IPStreams1).

3. Connect the IP Streams computer to the Radian Flex network.

4. Run IP Streams Setup.exe.

5. Reboot each IP Streams computer.

6. Confirm that each IP Streams PC is connected to the switch at 1 Gbps speed.

7. Copy IP Streams shortcut to startup folder if desired to automatically start IP Streams after each boot.

8. See Chapter 6, the Radian Xd chapter, for how to set up and optimize IP camera and RTSP feeds.

4.2.10 INSTALLING RADIAN XC — CONTROLBRIDGE OPERATOR SOFTWARE

1. Run Radian Flex Radian Xc — ControlBridge Operator Setup.

2. Confirm that each Radian Xc — ControlBridge Operator computer is connected to the network.

3. See Chapter 8, "Advanced Radian Flex Control," for configuring Radian Xc — ControlBridge Operator.

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4.2.11 INSTALLING RADIAN FLEX CAST —SOURCE REMOTE BROADCASTING SOFTWARE (OPTION)

1. Set static IP address (recommended).

2. Connect Radian Flex Cast —Source Remote Broadcasting computer to the network.

3. Run Radian Flex Radian Flex Cast —Source Remote Broadcasting Setup.exe. Do not install Radian Flex Cast —Source Remote Broadcasting on a Controller computer or a Radian Xd computer.

4. Insert the Radian Flex USB drive with the software license on it. Please consider physical drive size and port location to prevent damage or accidental removal.

5. Reboot each Radian Flex Cast —Source Remote Broadcasting computer.

6. Confirm that each Radian Flex Cast —Source Remote Broadcasting computer is connected to the switch at 1 Gbps speed.

7. Copy Radian Flex Cast —Source Remote Broadcasting shortcut to startup folder if desired to automatically start Radian Flex Cast after each boot.

8. See Chapter 6 for configuring Radian Flex Cast —Source Remote Broadcasting.

4.2.12 RUN THE RADIAN FLEX IGMP MULTICAST TEST

Proper functioning of multicast networking is critical to Radian Flex Systems. The Internet Group Management Protocol (IGMP) is a communications protocol used by hosts and adjacent routers on IP networks to establish multicast group memberships.

When IGMP is not configured properly on your Radian Flex switch, you may experience poor Radian Flex System performance, such as objects on the wall not moving via the Radian Flex Controller software, video tearing, or Radian Xds or Radian Xt UHD or HD Viewer displays disconnecting. It is important that the IGMP be set up correctly for a fully functional Radian Flex System.

An IGMP Multicast Test is available with Radian Flex software. The test verifies that IGMP has been configured on the switch correctly.

1. Before starting the IGMP Multicast Test, connect the following to the Radian Flex network: A Controller, at least two Radian Xt UHD or HD Viewer computers, and at least one Radian Xd Streamer computer with at least one stream open and connected to the Controller.

2. Click on the IGMP Multicast Test button. See Figure 4-4 for how to go from the Control Panel to the IGMP Multicast Test. In the Control Panel, go to the bottom of the panel and click the Settings… button. This takes you to the Settings and Preferences window. Click the System Setup tab to get to the IGMP Multicast Test button.
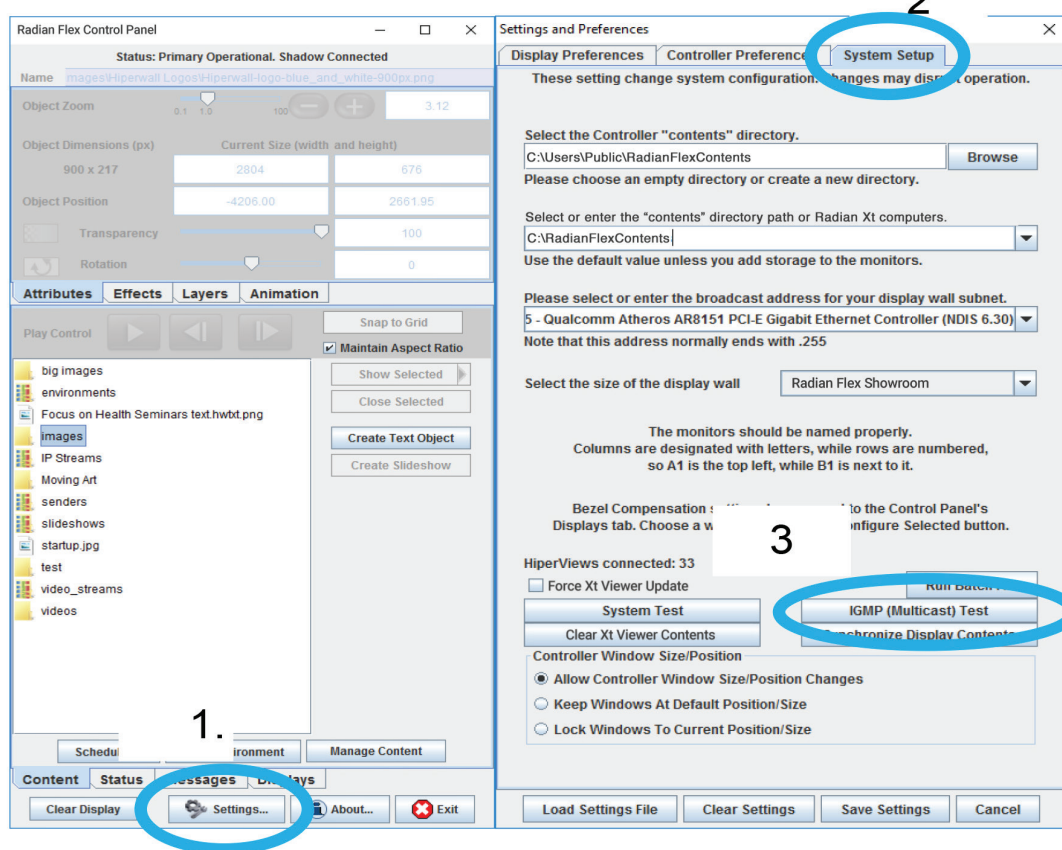
FIGURE 4-4. GO TO IGMP MULTICAST TEXT

3. Once you start the IGMP Multicast Test, the Radian Xt UHD or HD Viewer monitors will show some diagnostics.

4. Observe the results of the three phases of the test.

◆ Phase 1 will send approximately 750 Mbps of bandwidth to each Radian Xt UHD or HD Viewer computer from the Controller computer.

◆ Phase 2 will do the same, except it will be sent from an available Radian Xd Streamer computer.

◆ Phase 3 will send half of the Radian Xt UHD or HD Viewer data from the Controller and send the other half of the Radian Xt UHD or HD Viewer data from the available Radian Xd Streamer.

5. Evaluate the results of the test.

The test that is most significant is the one conducted during Phase 3. If IGMP is not configured correctly, each Radian Xt UHD or HD Viewer computer will be trying to receive 1.5 Gbps on a 1 Gbps Ethernet connection, which will cause excessive packet loss.

The tests conducted during Phase 1 and Phase 2 will provide a baseline so you can see what your Radian Xt UHD or HD Viewer computers are capable of handling. If you have older or slower Radian Xt UHD or HD Viewer computers, they may only be able to receive 60% to 75% of the packets sent.

If you compare the Average Packets Received on tests 1 and 2 to test 3, they should be similar. If test 3 is significantly lower, then there is an IGMP problem.

Another indication of an IGMP problem is if your sources are unable to generate 750 Mbps. This can be seen by examining the network lines on the output of the test. After the first few iterations, each number (percentage) should be roughly 75%. If you see a percentage that is significantly lower, such as 65%, then this is also a problem and could be an IGMP issue.

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Here are some examples from an IGMP Test:

Example	Phase 1	Phase 2	Phase 3	Result
Scenario 1: Average Packets Received	99.94%	100%	99.5%	Pass
Scenario 2: Average Packets Received	98.46%	99.74%	72.34%	Fail
Scenario 3: Average Packets Received	88.87%	92.65%	90.6%	Pass *

* Note: Although this test shows that the computer dropped almost 10% of the packets, Phase 3 was similar in results to Phase 1 and Phase 2.

It is also important to note that if even one computer running Radian Flex software passes the test, then most likely IGMP is set up correctly. So if other computers do not pass, IGMP may not be an issue.

6. Forward the results of the IGMP test to Black Box Technical Support.

Fixing IGMP issues is highly dependent on the make and model of your switch, so if you run into a problem and need help fixing IGMP, please contact technical support at 877-877-2269 or info@blackbox.com and we will be happy to help you troubleshoot and resolve the issues.

4.3 UPGRADING YOUR RADIAN FLEX SOFTWARE

Are you using an earlier version of Radian Flex Software?

Radian Flex software is an actively managed product, under continuous software development, with updates responding to customer needs, the latest graphics and visualization technology, and our vision and enthusiasm for developing software that makes video walls and distributed visualization systems high performance, easy-to-use, and affordable.

To upgrade from a previous version of Radian Flex Software, follow the release notes included with the updated software distribution.

To update the Controller(s), Radian Xd, Radian Xc and Radian Flex Cast, simply uninstall the old version and use the new installers, as described in the latest release notes. Radian Flex Pro Software with fault tolerance requires that both Controller computers be running the same version.

Before updating the Radian Xt UHD or HD Viewer computers:

1. Check that the contents directory location is entered correctly in the System Setup tab (click the Settings … button on the Control Panel) and check that the same directory has been used successfully for stored content before (so it exists before the upgrade process).

2. Also before updating, check that your entire wall count is present in the "Radian Xt UHD or HD Viewers connected" number on the System Setup tab. If not, wait for a few minutes to see if the Radian Xt UHD or HD Viewer computers reconnect. For the location of the Radian Xt UHD or HD Viewers connected number, see Figures 3-3 or 3-4.

The Radian Xt UHD or HD Viewer computers are automatically updated when they connect to the newly updated Controller computer(s).

1. The Radian Flex update installer removes the old version, installs the new software, and restarts the Radian Xt UHD or HD Viewer computer.

2. It does perform an EWF Commit operation for embedded PCs that have write protection enabled on their system drive.

3. There is a "Force Radian Xt UHD or HD Viewer Update" checkbox in the System Settings tab, but it should not be used unless a member of the Black BoxTechnical Support Team walks you through the process.

Updating your Radian Flex software is also a time to review and adjust your settings and preferences. Radian Flex software offers many settings and preferences to customize your Radian Flex System.

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1. Turn to Chapter 9, Customizing Your Radian Flex Experience, for more information on the capabilities available via the Settings … button and System Settings tab. Review the section on Control Panel Settings. This section includes the IGMP Multicast Test and System Test to help you adjust your settings.

2. Also optimize your Radian Xd live feeds. Radian Xd software has several settings and preferences for optimizing frame rate and CPU utilization for the content being delivered, the hardware in use, and current network speeds. Turn to Chapter 6 on Radian Xd software.

4.4 RADIAN FLEX SOFTWARE MAINTENANCE AGREEMENT

If you haven't already, sign up for a Radian Flex Software Maintenance Agreement to keep your Radian Flex software current and expedite support. Whether it's new display technology, faster CPU and more memory, or a bigger display wall, upgrade your hardware and Radian Flex software over time to adapt to your changing needs and future technology. Contact Black Box Technical Support for more information: 877-877-2269 or techsupport@blackbox.com

4.5 WHEN YOU ARE DONE INSTALLING OR UPDATING RADIAN FLEX SOFTWARE

You are ready to start showing and interacting with content on your Radian Flex System. See Chapters 4 through 10 for ideas on how to show and interact with content on your Radian Flex video wall and distributed visualization system.

5. CONFIGURING AND MANAGING WALLS AND DISPLAYS

5.1 ABOUT THIS CHAPTER

From grids to artistic arrangements, from LCD to dvLED display technologies, and from one size and type of display to a mixture in the same Radian Flex system, this chapter explains how to configure and manage your Radian Flex displays of any type using Controller, Xt Viewer, and Xv Layout software.

1. Locate and understand your Radian Flex licenses with the About button on the software interface and the summary information in this chapter.

2. Build wall groups on the Walls tab to organize all your displays into walls.

3. Configure walls on the Control Screen. Set up a display arrangement on the Control Screen that precisely matches the physical configuration of your Xt Viewer displays and connects with the walls in your Walls tab. This makes it possible to accurately import, arrange, and interact with content on your wall. Configure creative display arrangements with Xv Layout, such as mixing displays that are different types and rotating displays.

4. Radian Flex is dvLED ready! The Radian Flex Sync Option for Xt Viewer is new for Radian Flex 7 and supports better synchronization on large LED systems. Use the Radian Flex Sync Option for LED systems with multiple LED controllers. If your LED has a difference between actual resolution and reported resolution, use the LED Option for Xt Viewer to protect image quality. Configure your LED wall(s) in the Walls tab for these performance enhancements. Use Radian Flex Sync Option buttons in the Walls tab to detect and reset synchronization misalignment.

5. For systems with LCDs, set the bezel compensation settings and run a test for accurate display of content. Set preferences for how you view content across the bezels in the displays — natural view or full view.

6. New for Radian Flex 7, click the Background Content Sync checkbox for continuous content synchronization between the Controller and Xt Viewer computers. Background content sync is available for Radian Flex systems with the Xv Layout capability.

7. Customize your Control Screen with Wall Grid SmartFrame. With Wall Grid SmartFrame, content fills and snaps to the grid that you set. Use Wall Grid SmartFrame to make content arrangements faster and more consistent. Wall Grid SmartFrame comes with Xv Layout.

5.2 UNDERSTAND YOUR LICENSES FOR XT VIEWER AND XV LAYOUT

Your Radian Flex licenses are connected to the capabilities of your Radian Flex system and how you configure and manage your Xt Viewer displays. This section shows you how to identify your licenses for Xt Viewer and Xv Layout software and summarizes the capabilities of the software. The purpose is to understand which information in this chapter applies to your Radian Flex system.

5.2.1 SEE YOUR RADIAN FLEX XT VIEWER LICENSES

Click the About button on the Controller to see your Xt Viewer licenses and if your system has an Xv Layout license.

CHAPTER 5: CONFIG. AND MANAGING WALLS AND DISPLAYS

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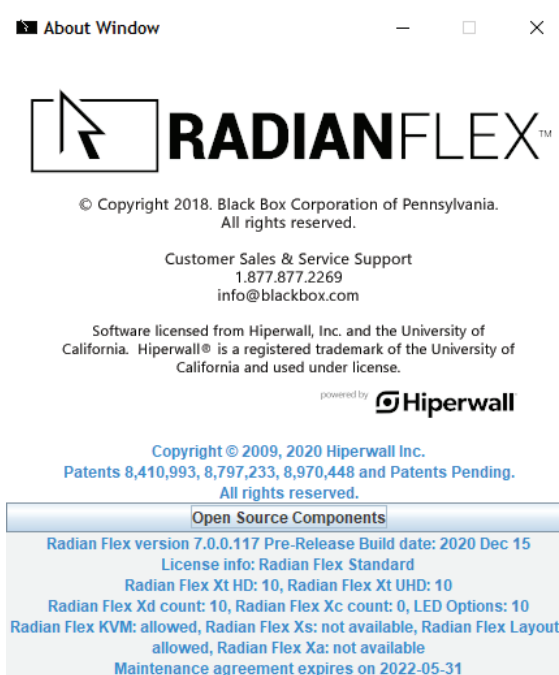
TABLE 5-1. LICENSES

DISPLAY	XT HD VIEWER, 1 LICENSE PER DISPLAY	XT UHD VIEWER, 1 LICENSE PER DISPLAY	LED, 1 LICENSE PER LED, IF NEEDED	RADIAN FLEX SYNC, APPROX 1 LICENSE PER CONTROLLER, IF NEEDED
Display resolution around 1920 x 1080 pixels	X			
Display resolution much more than 1920 x 1080 pixels		X		
LED resolution around 1920 x 1080 pixels; LED has difference between reported resolution and actual resolution; LED is distorting images	X		X	
LED resolution much more than 1920 x 1080 pixels; LED has difference between reported resolution and actual resolution; LED is distorting images		X	X	
LED resolution about 1920 x 1080 pixels and multiple LED controllers in the wall	X			X
LED resolution much more than 1920 x 1080 pixels and multiple LED controllers in the wall		X		X

NOTE: Talk with Black Box Technical Support at 877-877-2269 or techsupport@blackbox.com to find out if Radian Flex LED Option and Radian Flex Sync Option are needed for your LEDs and how many licenses are needed. In addition, Xt Viewer is required for both options.

CHAPTER 5: CONFIG. AND MANAGING WALLS AND DISPLAYS

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5.2.2 XT VIEWER AND XV LAYOUT CAPABILITIES

The table below summarizes the capabilities of Xt Viewer HD and UHD, and Xv Layout options in Radian Flex 7.

TABLE 5-2. XT VIEWER HD AND UHD AND XV LAYOUT CAPABILITIES

RADIAN FLEX SYSTEM	NEED XV LAYOUT FOR THIS?
Physical arrangement of walls and displays	
Video wall with displays in symmetrical grid; all displays same size, resolution, and bezels; displays attached to any surface; no LEDs	No
All landscape or all portrait displays	No
2 or more video walls	Yes
1 or more satellite displays	Yes
Displays attached to multiple viewing surfaces	Yes
Displays that are different sizes	Yes
Rotated displays	Yes
Mix landscape and portrait displays	Yes
Display features	
Mix displays with different bezel sizes	Yes
Walls or satellite displays, any arrangement, 1 or more LEDs	Yes
Mix displays with bezels with LED panels that have no bezels	Yes
Mix displays that have different resolutions	Yes
Accurate image scaling and alignment on LEDs, while maintaining actual resolution without missing content	Yes
Mix LED panels that are HD and UHD while maintaining each display's resolution and accurately scaling and aligning images across all displays	Yes
Precise content playback synchronization across multiple computers that drive multiple LED controllers	Yes
Additional Radian Flex Controller capabilities	
The Controller has a mini-map in the corner of the Control Screen. Use the mini-map for easy pan-and-zoom navigation across multiple walls and satellite displays.	Yes
The Show Selected button in the Content tab on the Controller has additional capabilities to show your content on a specific wall or display.	Yes
The Sources tab on the HiperController has additional capabilities to manage and show your HiperSource content on specific walls.	Yes
Wall Grid SmartFrame is new for Radian Flex 7. Wall Grid SmartFrame works correctly with any combination of display types, sizes, and resolutions, including LEDs.	Yes

Use the Xv Layout capability to design custom, creative arrangements of your Radian Flex video walls and satellite displays and add capabilities to your Controller. Use Xv Layout with LCD or LED video walls. See the table above for a summary of Xv Layout's capabilities in Radian Flex 7.

5.3 TOUR THE WALLS TAB AND CONTROL SCREEN

Walls list
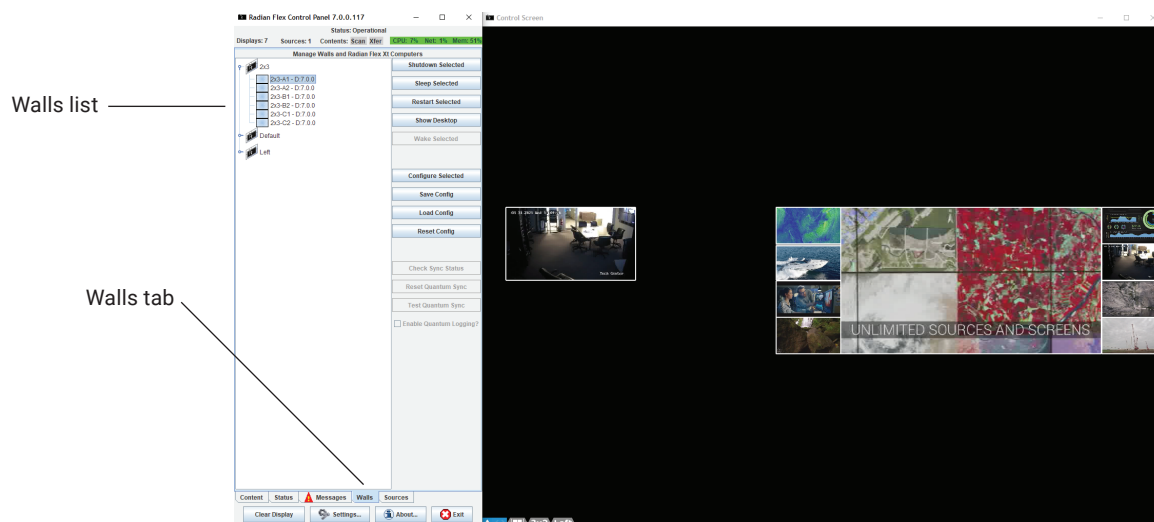
Walls tab

1. See the display count in the status dashboard at the top of the Control Panel. The status dashboard is available all the time on the Control Panel.

2. Click the Walls tab on the Controller. This opens a list of walls and displays and buttons to perform actions. The list of walls and displays is the Manage Walls and Xt Viewer Computers list.

3. Click the Wall in the Manage Walls and Xt Viewer Computers list to show a list of displays in each wall. If displays do not have a wall name, the displays are in a wall with the title, Default Wall. Click on walls or displays to select them. Expand the wall lists to see an inoperative or disconnected wall or display. To perform an action, click a wall or display(s) in list and then click the button.

4. Buttons for controlling Xt Viewer walls and displays:

- The Shutdown Selected button shuts down selected Xt Viewer displays and computers.

- The Sleep Selected button makes the displays go to sleep but the display computers are still active.

- The Restart Selected button restarts the Xt Viewer computers and displays.

- The Show Desktop button quits Xt Viewer software on the selected computers and opens a secure KVM window to each Xt Viewer computer from the Controller, allow support personnel to perform maintenance.

- The Wake Selected button wakes up sleeping or shut down Xt Viewer displays, assuming Wake-On-LAN is properly configured.

5. Buttons to configure walls and displays:

- The Configure Selected button shows the Monitor/Wall Settings window.

- The Save Config, Load Config, and Reset Config buttons save the current configuration to an XML file, and allow you to load a previously saved XML file containing a wall configuration, and you can clear the current configuration so you can start over.

NOTE: If you are using a Config file and no changes are needed to your Radian Flex system, keep using the Config file. Configuration of Xv Layout will override the Config file. Talk with Black Box Technical Support if you have questions about your Config file.

6. The buttons for Xt Viewer Radian Flex Sync Option are Check Sync Status, Reset Radian Flex Sync, Test Radian Flex Sync, and Enable Radian Flex Sync Logging checkbox.

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5.4 GROUP XT VIEWER DISPLAYS INTO WALLS IN WALLS TAB

Before you arrange the Xt Viewer displays on the Controller's Control Screen, list the walls and Xt Viewer displays in the Walls tab. See the instructions and graphics, below.

5.4.1 CHECK THE NAMES OF THE XT VIEWER COMPUTERS

All Xt Viewer computers must have a unique name. Before configuring your displays and walls, check that each Xt Viewer computer is named correctly:

1. Connect all the Xt Viewer computers to the Radian Flex network.

2. On the Controller, click the Settings button on the Control Panel and go to the Settings and Preferences menu.

3. Click the Display Preferences tab. Click the Show Diagnostics button to show the name of each Xt Viewer computer on the computer's display. See the graphics below.

4. Check that all Xt Viewer computers are displaying a name that will make it easy to know the sequence on the wall and maintain the computers. Check that there are no duplicate names.

5. If an Xt Viewer computer needs a new name, do this now in the Windows System Manager. For instance, keep the names given by the manufacturer of the display computers, or, rename the display computers. A spreadsheet scheme − A1, A2, A3, B1, B2, B3, etc. − can be helpful in visualizing where the tiles will be placed in the video wall.

5.4.2 SET UP THE WALLS LIST IN THE WALLS TAB

The Walls list is on the Controller in the Walls tab. See the illustration on the previous page.

1. Before organizing the list of walls and displays, check that each Xt Viewer computer has its own name and all Xt Viewer computers are connected to the Radian Flex network. See the instructions in the list, above.

2. Click the Walls tab on the Controller. Check that all Xt Viewer computers are in the Manage Walls and Xt Viewer Computers list. Click a wall in the list to show the Xt Viewer computers in the wall. If you have not named a wall yet, all Xt Viewer computers will be in a wall with the name, Default Wall. The Xt Viewer computer for a satellite display is its own wall.

3. To rename the Default Wall, or add a new wall to the list, click a wall or Xt Viewer computer in the list and then click the Configure Selected button. This opens a Monitor/Wall Settings window. In the Monitor/Wall Settings window, select or fill in the field for Select or Enter/Edit Wall Name and Choose Color for the tiles.

4. To move the Xt Viewer computers in the list into their wall(s), click an Xt Viewer computer in the list and then click the Configure Selected button. This opens a Monitor/Wall Settings window for Xt Viewer displays. In the Monitor/Wall Settings window, select or fill in the field for Select or Enter/Edit Wall Name and Choose Color for the tiles.

5. Click the Save button.

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5.5 CONFIGURE BEZEL SETTINGS

For displays with bezels, before building a wall group on the Controller, adjust the bezel compensation settings and select whether to display content with full view or natural view across the bezels.

NOTE: LED panels do not have bezels, and therefore do not have bezel compensation settings.

Displays with bezels may come with pre-set bezel compensation settings from the manufacturer; however, Black Box recommends that you test and fine-tune the settings to improve image quality across the displays in your video wall.

1. Test the image alignment on all Xt Viewer displays. To perform the test, show content that has straight diagonal lines and inspect the alignment on your wall. If you are looking for content that has straight diagonal lines to use for this test, talk with Black Box Technical Support (techsupport@blackbox.com) for content to use in this test.

2. The bezel compensation settings need to be adjusted if the diagonal line being displayed does not line up from corner-to-corner across each Xt Viewer display.

To adjust the bezel compensation settings:

1. Identify the bezel area for each display. Measure the overall height and width of the complete display and the height and width of the active area of the display panel. See the display manufacturer's User's Guide for more information. Accurate measurements are required in order to accurately display content on your wall.

2. Click the Walls tab on the Controller.

3. If all displays in the wall have the same bezels, enter the bezel settings for the wall. On the Walls tab, click the wall in the Walls tab list and then click the Configure Selected button.

This brings up the Monitor/Walls Settings window for the wall.

4. If you are replacing a display, or have Xv Layout and are mixing displays with different bezel sizes, enter the bezel settings for the selected displays. On the Walls tab, click the Xt Viewer computer(s) in the Walls tab list and then click the Configure Selected button. This brings up the Monitor/Walls Settings window for the display or displays.

5. Look at the Bezel Settings area in the Monitor/Wall Settings window. For each wall or display, fill in the width and height of the display and the width and height of the display's active area in millimeters or pixels. If you are entering measurements for a display, click the checkbox to prioritize the measurements for the display over the wall.

Pro tip: The Monitor/Walls settings area has spaces to enter the width and height in millimeters or pixels. These values can be specified in pixels or any units. The ratio is what matters.

5.6 SELECT FULL VIEW VS. NATURAL VIEW

For displays with bezels, Xt Viewer software offers flexibility in how your content adjusts to the bezels in the displays. Select Natural View or Full View depending on your requirements.

To select Full View or Natural View, see the the instructions below.

1. Click the Settings button on the Controller. This opens the Settings and Preferences window.

In Natural View, some content will appear "under" the bezels, but the content looks smooth when you look from one Xt Viewer display to the next Xt Viewer display. In this case, the human eye "fills in" the missing content, as it does when looking through a paned window. Natural view is usually best for images, movies, and Xd content.

In Full View, none of your content appears under the bezels but this creates "jumps" in the content where edges may not match exactly as you look from one Xt Viewer display to the next Xt Viewer. Use Full View for content objects that need all data visible on the Xt Viewer displays.

2. Click the Display Preferences tab on the Settings and Preferences window.

3. In the Display Preferences tab, look at the Viewing Mode options and select Natural View or Full View.

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4. Changes made in the Display Preferences tab take effect immediately and remain in effect even if the User cancels out of the Settings and Preferences window. If the settings are saved with the Save Settings button, they will be used next time the Radian Flex system is started.

5.6 CONFIGURE LEDS WITH XT VIEWER LED OPTION

Radian Flex is LED Ready! The LED Option for Xt Viewer protects image quality for LED displays that have a difference between the reported and actual resolution.

To see if your Radian Flex system has licenses for Xt Viewer LED Option, click the About button on the Controller and see the list of licenses in your Radian Flex system.

Some LEDs report a standard resolution such as 1920 x 1080, while the physical LED panel actually has less resolution physically than the reported one, such as an actual resolution of 1760 x 800.

This disparity in reported and actual resolution immediately creates a problem in visualization. While the Xt Viewer computer's graphics card may produce 1920 x 1080 visuals, without Xt Viewer LED Option, the LED may either scale (shrink) 1920 x 1080 to LED Actual Resolution.

SET UP LED OPTION FOR XT VIEWER

The LED Option for Xt Viewer prevents distorted and missing content by using the actual resolution of the LED display. To set up the LED option:

1. Check the names of the Xt Viewer displays and set up the Walls list on the Walls tab on the Controller. Add the display position settings for each display.

2. Determine the actual resolution of the LEDs in your wall. Look at the LED invoice, delivery receipt, and packaging for this information. Using the actual resolution of each LED, determine the anchor points, the top left corner, for each LED. List the actual resolution and reported resolution for each LED display.

3. On the Controller, click the Walls tab and then click the LED display in the walls list. Start with the LED display with the wall anchor point. Click the Configure Selected button on the Walls tab. This opens the Monitor/Wall Settings window.

4. On the Monitor/Wall Settings window, go to the LED Option settings. Check the box marked "This is an LED display" to allow the system to recognize that the actual resolution will be used and cropping of a portion of the display area will be performed.

5. For the video wall to correctly display images at the actual resolution of the LED, input the values in pixels in the LED Options Settings menu. See your billing and delivery invoices and packaging for the actual resolution of the LED displays in your wall.

   The Left Crop and Top Crop values direct the system how many pixels (width and height) to cut out (crop) from the reported resolution by the LED tile controller. If cropping is needed, the pixels are cut from the left and top edges, respectively. This has the effect of pushing the painted image to the right and down from the left and top edges. The Controller then uses the entered Display Width and Display Height values as the effective resolution for the display computer.

6. Repeat for all LED that have a disparity between actual and reported resolution and are cropping or shrinking content.

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5.7 CONFIGURE WALL GRID SMARTFRAME

New for Radian Flex 7 – set up a Wall Grid SmartFrame – a SmartFrame for walls. Wall Grid SmartFrame comes with the Xv Layout capability. Use the new Wall Grid SmartFrame to create a custom design grid that flows across all displays in a wall. Set up the dimensions of the wall grid via the Walls tab and then turn the grid on and off as needed via the Content tab.

NOTE: Radian Flex systems without Xv Layout can continue to use the Display Grid SmartFrame for design grids on each display.

1. Click the Walls tab on the Controller.

2. Click a Wall in the Walls tab list and click the Configure Selected button.

3. Click the checkbox to Enable Wall Grid for this wall. Select the horizontal and vertical regions. Click the Save button.

5.8 BUILD, MOVE, AND CONFIGURE WALLS ON CONTROL SCREEN

Check the names of your Xt Viewer computers and group your displays into walls on the Walls tab. For Radian Flex systems with LED panels, depending on your licenses, set up your LED panels with the Xt Viewer LED Option or Xt Viewer Radian Flex Sync option. If your Radian Flex system has LCD displays with bezels, select Natural or Full View, and enter your bezel compensation settings.

Now, build a wall group and then center the wall group on the Control Screen.

5.8.1 BUILD A WALL GROUP ON THE CONTROL SCREEN

Set the position coordinates for each Xt Viewer display in relation to each other, using the center of the Control Screen as the starting point.

NOTE: If you are using a Config file and no changes are needed to your Radian Flex system, keep using the Config file. Configuration of Xv Layout will override the Config file. Talk with Black Box Technical Support if you have questions about your Config file.

1. Before getting started, check the names of your Xt Viewer computers and group your displays into walls in the Wall tab.

2. Sketch your layout of Xt Viewer displays, identify the host names of the displays, and identify the actual resolution of each display in pixels. For LED, use the actual resolution, not the reported resolution. For the actual resolution, check the information from the LED manufacturer that came with your LED.

3. Plot the anchor points in pixels. Anchor points in a group of Xt Viewer displays are relative to each other. Each display has an anchor point in the top left corner. The wall anchor point, or anchor point for a group of displays, is in the top left corner. A spreadsheet program can be helpful for determining the coordinates of the anchor points.

Next, enter the coordinate values in the monitor configuration dialog box for each display:

1. Click the Walls tab on the Controller. Look at the list of walls in the Walls tab. Click a wall in the list to show the Xt Viewer computers in the wall.

2. Click the first Xt Viewer computer to be configured – the display with the wall anchor point in the top left corner. Click the Configure Selected button. This opens the Monitor/Wall Settings window for displays.

3. On the Monitor/Wall Settings window, in the Display Position Settings, enter the x and y coordinates of the display's anchor point – the display's top left coordinate – in the fields. Click the Save button.

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5.8.2 CENTER A WALL GROUP ON THE CONTROL SCREEN

After building the wall group, center the physical arrangement of the Xt Viewer displays on the Control Screen. Offsets are important – if there are no offsets, a wall will appear in the lower-right quadrant of the Control Screen and multiple walls will stack on top of each other.

1. Build a wall on the Control Screen. The wall will be in the lower right corner of the Control Screen.

2. In the Walls tab on the Controller, look at the walls in the Wall list. Click the wall that you would like to configure and then click the Configure Selected button. This opens the Monitor/Wall Settings menu for walls.

3. In the Monitor/Wall Settings window for walls, look at the Wall Offset Settings section. Enter the number of pixels to offset the Wall Anchor Point horizontally (X) and vertically (Y) to center the wall on the Control Screen. Use +/− to move the wall. Click Save. The offset is necessary because the wall anchor point (0,0) is the same as the global origin coordinate (0,0), which is in the center of the Control Screen.

5.9 ENHANCE LEDS WITH RADIAN FLEX SYNC OPTION

Radian Flex 7 adds a new option to Xt Viewer called Radian Flex Sync to support better synchronization on large LED display systems.

The Radian Flex Sync Option enables a new-technology Xt Viewer that uses hardware-based GenLock synchronization to make the LED controllers connected to several Xt Viewer computers refresh at exactly the same time. GenLock synchronization, plus enhanced video synchronization mechanisms, greatly reduce the possibility of tearing or frame differences that could be visible on a seamless LED video wall.

The Radian Flex Sync Option is a purchased license that is enabled on a per-Xt Viewer computer basis. Radian Flex Sync also requires Xv Layout in order to be used.

To enable the Xt Viewer Radian Flex Sync Option:

1. Before starting, group the LEDs into a wall in the Walls tab. Build a wall on the Control Screen and apply offsets to center the wall. Make sure you have defined a wall containing all the Xt Viewer nodes in the LED wall and set the options for those nodes. If you are also using Xt Viewer LED Option, install the LED Option before installing Radian Flex Sync Option.

2. Click the Walls tab on the Controller.

3. In the Walls tab, click the LED wall in the walls list – do not click on individual displays in the list – and then click the Configure Selected button.

4. The Monitor/Walls Settings window pops up with the Xt Viewer Radian Flex Sync section. Select the Enable Xt Viewer Radian Flex Sync checkbox.

After you have enabled the Radian Flex Sync Option for a wall, click on the wall in the Walls tab list to see a set of Radian Flex Sync-only options and buttons.

Click the Walls tab to see the buttons and checkbox for Xt Viewer Radian Flex Sync Option:

1. The Check Sync Status button queries the sync hardware status of each of the Radian Flex Sync nodes in the wall, logs that status to the Messages tab, and then automatically switches to the Messages tab. If things are working properly, there will be one synchronization "server" and the rest of the nodes will be "clients." If something appears wrong, the Xt Viewer button may help.

2. The Reset Radian Flex Sync Sync button asks each of the Radian Flex Sync nodes to reset their sync state. If there is currently an active sync server, Radian Flex Sync will try to make the current sync server the server again. If the sync server is missing – for instance, due to failure or disconnect of the sync cables – Radian Flex Sync will choose a sync server.

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3. The Test Radian Flex Sync Sync button enables a test that shows if the Radian Flex Sync wall is properly synchronized or not. This test removes all content from the wall and might be disruptive to people watching the wall, so a warning will confirm whether to run it or not. If you desire to restore the content to your wall after the test, save the content as a Radian Flex Environment before starting the test. Radian Flex Environments are saved content.

4. The Enable Radian Flex Sync Logging option turns on logging from each of the Radian Flex Sync Xt Viewer nodes and sends those log messages to the Messages tab. Only use this option in conjunction with your organization's technical support to diagnose a problem.

5.10 MANAGE CREATIVE DISPLAY ARRANGEMENTS WITH XV LAYOUT

This section is for Radian Flex systems with Xv Layout. For more about Xv Layout, see the section on understanding your Radian Flex licenses.

To see if your Radian Flex system has licenses for Xv Layout, click the About button on the Controller and see the list of licenses in your Radian Flex system. The section on licenses shows the About button.

5.10.1 POSITION MULTIPLE WALLS OR A SATELLITE DISPLAY ON THE CONTROL SCREEN

For Radian Flex systems with Xv Layout: Build all the wall groups and satellite displays on the Control Screen and then apply offsets.

To position multiple walls or a satellite display on the Control Screen:

1. Before getting started, check the names of your Xt Viewer computers for duplicates and rename computers as needed. Keep track of the names of the Xt Viewer computers and their locations in your Radian Flex distributed visualization system.

2. Next, set up the Manage Walls and Xt Viewer Computers list in the Walls tab. Treat a satellite display as its own wall group – assign the satellite display to its own wall group in the list. See the section, above, for how to set up the list on the Walls tab.

3. Sketch your physical arrangement of Xt Viewer computers in walls. Write the names of the Xt Viewer computers, their X and Y pixel resolution, wall anchor point, and display anchor points. See the section, above, on how to build a wall group on the Control Screen.

4. Build each wall group on the Control Screen. Add the anchor points of each Xt Viewer display to the Monitor/Wall Setting window. Treat a satellite display as its own wall group. See the instructions in the section, above, on how to build a wall group on the Control Screen. The wall groups and satellite displays are stacked on top of each other because the wall anchor points are (0, 0) – (0, 0) is the global origin coordinate in the center of the Control Screen.

5. Next, move the walls and satellite displays in relation to each other, lay out the satellite displays separately from wall groups, and center everything on the Control Screen. In the Monitor/Wall Settings window, apply a unique offset value for each wall group. This moves the entire wall group. See the section, above, on how to apply offsets to a wall group. See the graphic, below, for an example of how to apply offsets to two wall groups.

5.10.2 SET THE SCALE OF WALLS AND DISPLAYS ON THE CONTROL SCREEN

Set the scale of walls and displays after building a wall group but before applying offsets. If you are using displays or walls of multiple sizes, types, resolutions, bezels, or mixing portrait and landscape displays, adjust the scale of the displays to be in proportion to each other. When displays are in proportion to each other, content scales correctly across the displays.

NOTE: Changing the scale factor of a wall does not change the configured values of Xt Viewer displays.

5.10.3 ROTATE WALLS AND DISPLAYS

Create artistic installations with Xv Layout's rotation feature. Use Xv Layout to precisely rotate the whole video wall or individual displays.

The Rotation setting rotates the wall or display using its anchor point, the top left corner, as the axis of rotation. Enter a value in the rotation field representing the angle of rotation, in degrees, rotating counter-clockwise (CCW). Negative values will rotate clockwise.

NOTE: The rotation setting for walls rotates the wall around the anchor coordinate of the wall, the top left corner. The wall setting does not change the values of the display settings.

How to rotate a wall or display:

1. Check that all walls and displays are ready on the Control Screen. Check the names of the Xt Viewer computers, build the walls on the Control Screen, and apply offsets to center the walls and displays on the Control Screen. If displays in the wall groups are a mixture of sizes and resolutions, apply scale values before rotation.

2. Click the Walls tab on the Controller. Look at the walls list in the Walls tab. Click the wall group or display to be rotated and click the Configure Selected button.

3. Look at the Rotation Settings fields on the Monitor/Wall Settings window. The rotation setting rotates the wall around the anchor coordinate of the wall or display. The anchor coordinate is the top left corner. Key in a value representing the angle of rotation, in degrees, rotating counter-clockwise (CCW). Negative values will rotate clockwise. Click the Save button.

4. Pro Tip: Use Xv Layout for rotation – do not use the graphic system's right-angle rotation.

- The graphics system, such as Nvidia and Intel, usually provides native settings for right-angle rotation such as Portrait Mode and Portrait Mode (flipped). However, these settings introduce a performance penalty due to the overhead of processing rotated modes. This performance hit tends to be seen in some lower-powered display computers.

- Using Xv Layout's rotation feature is beneficial in these cases since the graphics system can remain configured in normal (non-portrait) mode while Xv Layout Rotation will handle drawing rotated imagery.

6. DISPLAY AND INTERACT WITH CONTENT

After the hardware is set up and the software is installed and configured, you are ready to start using Radian Flex software to display and interact with content on your Radian Xt UHD or HD Viewer displays.

Radian Flex software supports a wide range of content and offers many choices for design effects, giving you many options for achieving the look you want on your Radian Flex video wall and distributed visualization system.

You can use the Control Panel and Control Screen to exhibit one content object across the whole video wall, or, as shown in the figure below, mix several types of content – images, video, desktop capture, streaming sources – all shown simultaneously, anywhere on your wall, to best suit your needs.
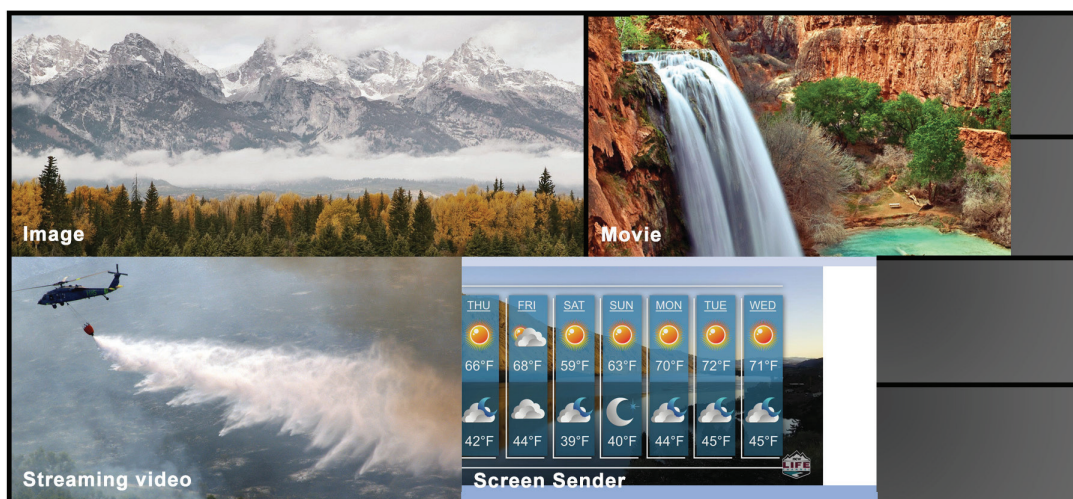
FIGURE 6-1. VIDEO WALL EXAMPLE

6.1 USING THE CONTROL PANEL AND CONTROL SCREEN

The Control Panel takes you into many resources for importing, delivering, and creating content to show on your Radian Xt UHD or HD Viewer displays. Your Radian Flex software gives you design freedom to effectively expand to make the most of the space available on your video wall while also giving you control of all the details that help give your content the maximum impact.

Click on the Radian Flex Controller shortcut on the Controller computer to start the Radian Flex System. The Radian Xt UHD or HD Viewer displays wake up and the Control Panel and Control Screen appear on the Controller computer.

The figure on the next page shows the Control Panel on the left and the Control Screen on the right. The Control Screen shows a custom configuration – in this case, two large display walls and a satellite wall.

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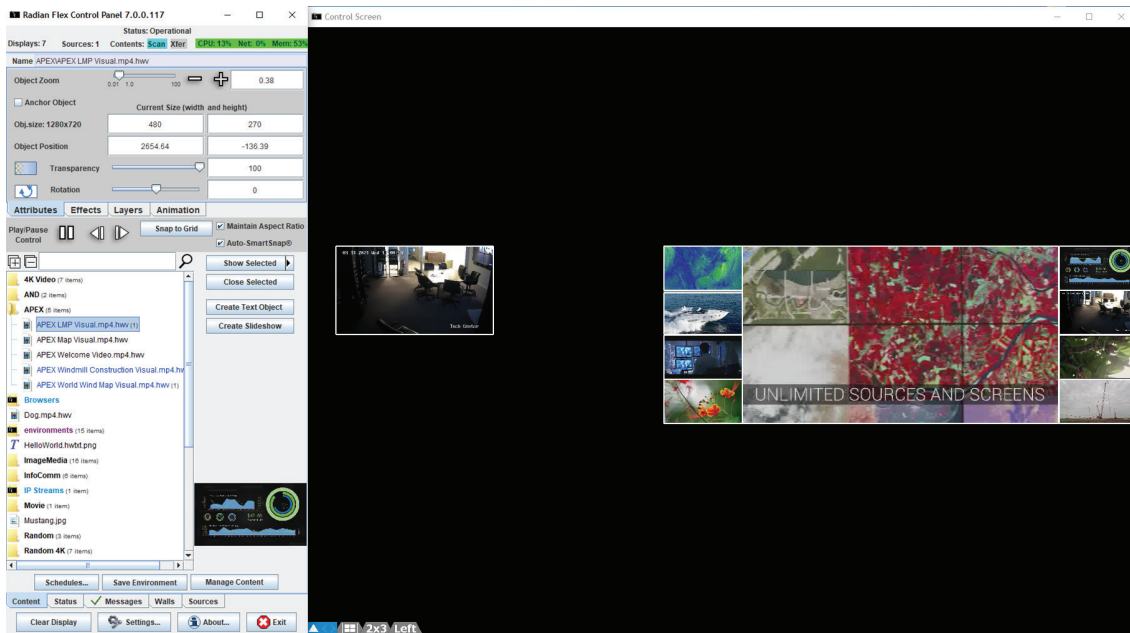
FIGURE 6-2. CONTROL PANEL (LEFT) AND CONTROL SCREEN (RIGHT)

The Control Panel is the hub for the Radian Flex System. The next figure details the Control Panel's many features.

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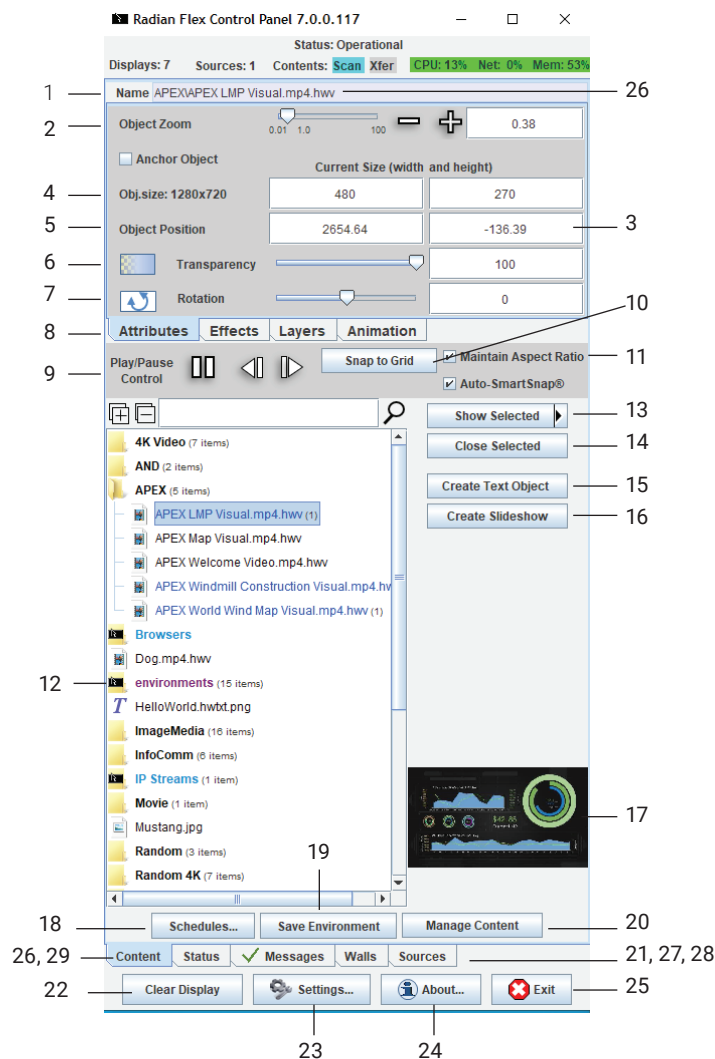
FIGURE 6-3. CONTROL PANEL

KEY TO CONTROL PANEL GRAPHIC:

1. Name of the object on the Control Screen.

2. Zoom level of the object.

3. Object dimension in pixels.

4. Current size of the object.

5. Current position of the object, (0, 0) being the center of the screen.

6. Transparency of the object, 0=Transparent, 100=Opaque.

7. Rotation value of the object from -180 degrees to 180 degrees.

8.Tabs for different visual properties and options for creating and displaying content: Attributes Tab, Effects Tab, Layers Tab, and Animation Tab.

9. Play control for movies, Slideshows, and video streams (Streamer).

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10. SmartFrame the selected object into surrounding grid.

11. Maintain the aspect ratio of the object when the SmartFrame is applied.

12. Special folders in Content List for Environments, IP Streams, Senders, Slideshows, and Video Streams.(Streamers).

13. Show selected content object(s) from the Content List. A submenu arrow on the Show Selected button adds options.

14. Close selected object to remove from Control Screen and Radian Xt UHD or HD Viewer displays.

15. Create a Text Object.

16. Create a Slideshow with selected objects.

17. Preview thumbnail on Control Panel for the selected object. (For thumbnails on Control Screen).

18. Open the Schedule Manager.

19. Save all open objects' states, such as positions, as an Environment.

20. Open Content Manager to import new contents or reorder/delete existing contents.

21. Messages tab

22. Clear the Radian Xt UHD or HD Viewer displays by closing all open objects on the display wall.

23. The Settings … button goes to the Settings and Preferences window for the Controller Preferences tab, Radian Xt UHD or HD Viewer Display Preferences tab, and System Setup tab, also buttons for loading, clearing, saving, and canceling settings.

24. About box with information icon for Radian Flex version information and copyright information.

25. Open the Exit options menu.

26. Content tab

27. Walls tab

28. Sources tab

29. Status tab – Shows Controller mode and status. For instance, this Control Panel is the primary Controller for a Radian Flex Pro with a shadow Controller activated. The Radian Flex Pro has two Controller computers for fault tolerance. See Chapter 5 for more about fault tolerant operations and Shadow Mode.

6.2 USING THE CONTENT LIST

The Content List is located in a large rectangle on the Control Panel. Use the list in two ways:

1. Double-click on content objects from the Content List and the content will show up on the Control Screen and on the video wall.

2. Use the Control Panel to apply attributes and effects to the content object to change its appearance on the Control Screen and video wall.

Content that currently appears on the wall is listed in red text in the Content List. The content in the list is displayed as a tree, much like Windows Explorer® can show a file system as a tree. An example of a Content List is shown in the next figure.
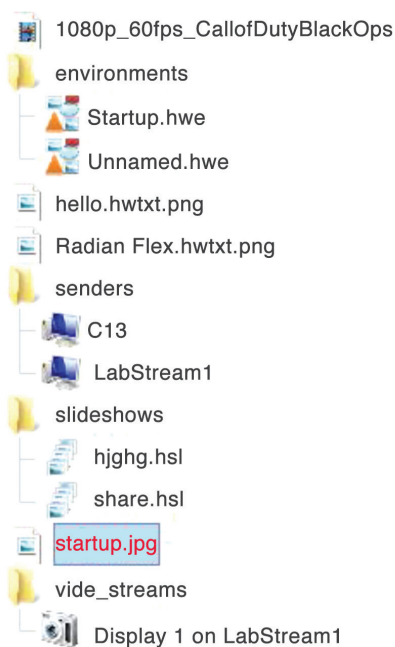
FIGURE 6-4. CONTENT LIST

There are several special folders in the Content List that cannot be moved or renamed. They are marked with a HW logo on the folder icon. These folders hold Environments, IP Streams, Senders, Slideshows and Streamers and are named "environments," "IP streams," "senders," "slideshows," and "video streams."

The Control Screen shows the arrangement of monitors in the video wall(s).

1. To conserve resources, the Control Screen shows reduced-resolution "thumbnails" for some object types, while all content is shown at full resolution on the display wall.

2. Movies are always shown at reduced resolution and frame rate on the Control Screen, while Radian Xd content – sending desktop content and streaming video and IP cameras – are shown at full resolution and frame rate on the Control Screen only when they are selected. Slideshows are always shown at lower resolution on the Control Screen. This reduces the CPU and graphics processor burden on the Controller, while maintaining high-quality performance on the display wall.

6.2.1 STORED CONTENT OBJECTS

Radian Flex software sorts content into three categories: stored content, dynamic/just-in-time content, and compound content.

Stored content objects are stored on the computers running Radian Xt UHD or HD Viewer software and on the Controller computers, which allows content to be rapidly accessed for displaying on the wall. Radian Flex software supports the following types of stored content:

1. Digital images in jpeg, png, bmp, gif, and tiff formats, including extremely high-resolution images, up to one gigabyte or more. Larger images are preprocessed and stored in the Radian Xt UHD or HD Viewer computers so they can be resized and repositioned in real time.

2. Video files, including 1080p and 4K videos, encoded with H.264 and AAC codecs, are converted to Radian Flex Video (.hwv) files for synchronized playback on multiple Radian Xt UHD or HD Viewer displays. Upgraded Radian Flex Systems with QuickTime installed can continue to play QuickTime movies, but all newly imported movies will be converted to Radian Flex Video format.

3. Text objects for digital signage or to label other content. See Chapter 7 for animating content, including text.

For importing stored content, see Importing Stored Content with the Content Manager.

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6.2.2 DYNAMIC/JUST-IN-TIME CONTENT

Radian Xd content objects are not imported – they are dynamic, just-in-time content objects delivered to the video wall. After configuring Radian Xd software, the Controller software automatically detects all available Radian Xd computers, and lists them in the Content List.

1. Radian Xd Streamer – Live content streamed across the network from originating computers. This is useful, for example, if you want to show live video from a digital video camera or a movie from a DVD player.

2. Radian Xd Sender – Real-time screen display from any computer running Radian Xd software. This is useful, for example, if you want to show web pages, commercial applications, or control room applications with many windows of data.

3. Radian Xd IP Streams – Stream IP cameras and RTSP sources with a camera management tool and media engine. Using the software's management interface, connect with IP cameras, manage their video streams, and display them on the wall.

4. Radian Flex Cast —Source Remote Broadcasting software is an option. Radian Flex Cast —Source Remote Broadcasting software shares live feeds, information, and other content between Radian Flex Systems located around the world, providing enhanced communication and collaboration.

You can share content quickly between multiple locations or divisions of an organization. Radian Flex Cast —Source Remote Broadcasting uses Radian Xd Sender software as sources and appears in Senders in the wall.

See Chapter 8 for configuring and using Radian Xd and Radian Flex Cast software.

6.2.3 COMPOUND CONTENT

Radian Flex compound content adds functionality to any type of content. You create compound content by selecting the content you want to show and the way you want to show it – for instance, as a slideshow, environment, or animation:

1. Choose some content objects in the Content List and click the Create Slideshow button on the Control Panel. Slideshows are a repeating sequence of images, big images, videos, or animation in a saved slideshow object. This is useful, for example, if you want to show a repeating presentation, digital signage applications, or rotate through Radian Xd content from remote computers or IP cameras. You can show multiple slideshows at the same time. There is no limit to the number of saved slideshows.

2. Click the Save Environment button on the Control Panel. Arrange multiple content objects and then save that arrangement as an environment to reuse later and even schedule it to run. When you open an environment, you can clear all content from the Radian Flex or overlay the environment over the content that is currently being shown. There is no limit to the number of saved environments. Save time by preparing and then saving environments that are ready to run when you need them.

3. Select the Animation tab on the Control Panel. Animations are sequences of actions to automatically move a content object across the video wall using a simple user interface. Define key frames and waypoints, and Radian Flex software automatically interpolates the path, making complex motions easy. You can also create ticker-tape style text with this feature.

Creating compound content is as simple as clicking on a button or tab in the Control Panel. Importing compound content is provided later in this chapter. To create environments, slideshows, and animations, go to Chapter 7.

6.2.4 IMPORTING STORED CONTENT WITH THE CONTENT MANAGER

Before you can use stored content objects on the display wall, you must import them into Radian Flex software. After importing, copies of the stored content are stored on the Controller computer and on each Radian Xt UHD or HD Viewer computer forming the display wall. This allows the content to be shown and managed on the wall nearly instantaneously.

No import process is needed for Radian Xd content. Content from computers streaming video and live IP camera feeds, and sending desktop capture, is dynamic, just-in-time content. After configuring Radian Xd software, all available sources for these content types are automatically detected, and they appear in the Content List in special content folders specific to their type. See Chapter 6 for more on configuring and using Radian Xd content.

To Add or Modify Stored Content Objects:

1. In the Control Panel, click the Manage Content button. This launches the Content Manager window, shown next.

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2. The left side of the window is a file system navigation box. Navigate to your content and either drag it to the "Radian Flex contents" tree on the right or select a destination in the tree and then click the "Import to contents" button (the word "contents" will change depending on the selected destination folder). Multiple items can be selected or dragged for import. In addition, objects can be dragged in from Windows Explorer windows.
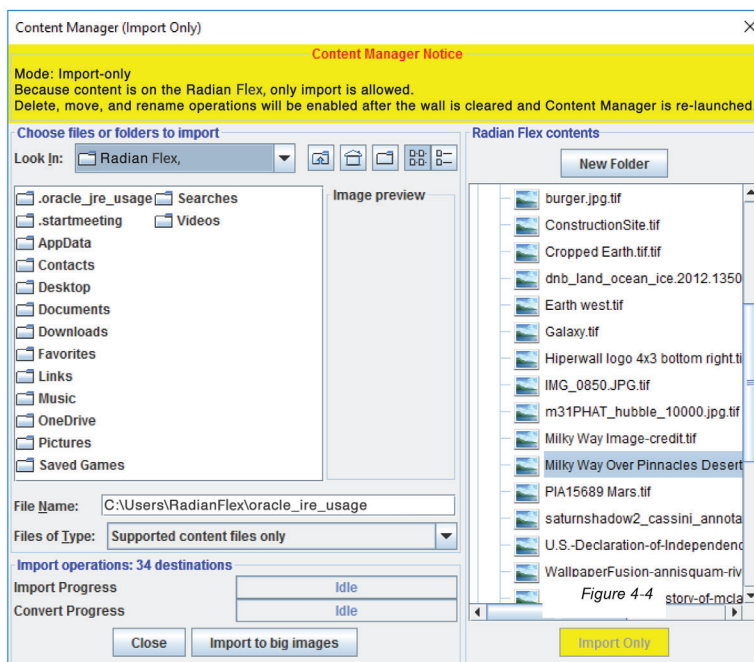
FIGURE 6-5. CONTENT MANAGER WINDOW

3. To delete objects, select them in the tree and click the "Delete Selected" button. Some objects, like the startup.jpg image and special folders cannot be deleted.

4. To rename a content object, select it, then click the name (and release the mouse button) and wait for a short time (or select the name and press the F2 key). The name will become available for editing. Names generally follow Windows filename restrictions, but avoid using punctuation. Some objects, like the startup.jpg image and special folders, cannot be renamed.

5. To move an object, just click it and drag it to its destination. You will see visual feedback if the move is legal. Objects other than the appropriate types cannot be dragged into special folders.

NOTE: If the content object is very large or you have many Radian Xt UHD or HD Viewer computers, it may take a few minutes for the content to be copied.

IMPORTANT NOTE: If there is content being displayed on the wall, the Content Manager will open in "import-only" mode. In this mode, shown above in Figure 6-5, imports are allowed, but folder creation and deletion, movement, and renaming of any content are not permitted.

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6.3 OPTIONS FOR DISPLAYING CONTENT

Radian Flex software offers several ways to show content:

1. Show one object on the wall. For example, show a very large, high-resolution graphic, using the entire wall.

2. Show multiple copies of one object on the wall. For example, place clones or duplicates of the content on opposite sides of the wall to ensure that everyone has a good view of the object. This is also useful for custom configurations with monitors in multiple physical locations.

3. Show mixed content on the wall. For example, show a video, a still high-resolution graphic, a live website, and live feeds from IP cameras, using different parts of the wall for each content object.

4. Add visual effects to content with the Attributes Tab and Effects Tab.

5. Create and manage layers with the Layers Tab.

6. Create a text object.

7. Show a slideshow.

8. Open a saved Radian Flex Environment, and your pre-set content shows automatically.

6.3.1 SHOWING A CONTENT OBJECT

Each content object can have different attributes. Radian Flex software gives you options for interesting visual effects by changing the size, rotation, transparency and shading of a content object. For more information about setting these options, see Positioning and Sizing Content.

FIGURE 6-6. SHOW CONTENT ON SCREEN

To Show Content on the Radian Xt UHD or HD Viewer Displays:

1. In the Control Panel, go to the Content List. Click on the content object in the Content List to see an object's thumbnail representation. Thumbnail views of most available objects are shown in the lower right of the Control Panel.

2. Select the content you want to show on the wall and click Show Selected. The content will display on the Control Screen and on the Radian Xt UHD or HD Viewer displays.

◆ If this content object has never appeared on the wall before, it appears in the center of the wall at actual size with 0 degrees of rotation, 0% transparency and 100% of all color shading. You can change these options – see Positioning and Sizing Content.

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- If this object previously appeared on the wall, the content appears on the wall using the same positioning, sizing, rotation, transparency and shading settings that it had the last time it appeared.

- You can also double-click on an object to show it on the wall.

- Holding the Control Key while clicking Show Selected opens the object in the center of the wall with zoom 1.0 and no transparency or other effects (reset to default settings).

- Holding the Alt Key while clicking Show Selected opens the object in the center of the wall, but completely transparent. This allows the user to size and position the object as desired before making it visible by reducing the object's transparency.

- The right-side arrow on the Show Selected button pops up a menu that allows normal, transparent or default object opening, just as the modifier keys described above do

6.3.2 SHOWING MULTIPLE COPIES OF AN OBJECT

You can show multiple copies of a content object on the Radian Xt UHD or HD Viewer displays.

Each copy of a content object can have different attributes. You can add interesting visual effects by changing the size, rotation, transparency, and shading of individual copies of a content object. For more information about setting these options, see Positioning and Sizing Content.

Use Shift-Click (contiguous multi-selection) or Ctrl-Click (non-contiguous) to select several objects at once. Pressing the Show Selected button will show the objects on the wall (and the Alt or Ctrl key modifiers for Show Selected work as described above even for multiple objects). Clicking on a folder or other non- content item clears the multi-selection.

FIGURE 6-6. SHOW MULTIPLE COPIES OF AN OBJECT

If the content object is a movie, or Radian Xd content, then all copies of the content object are synchronized.

If you manually open multiple copies of a slideshow, they may appear out of sync. If they are out of sync, then they will stay out of sync by the same amount of time for as long as they appear on the wall, creating interesting visual effects. To synchronize the start time of slideshows, use a Radian Flex Environment to start them at the same time (see Chapter 7 for creating Radian Flex Environments, and for creating Slideshows).

To Show Multiple Copies of a Content Object:

1. In the Control Panel, navigate to the Content List.

2. Select the content objects you want to show on the wall. Click Show Selected as many times as you want the content to appear on the wall. Each copy appears exactly on top of the previous copy.

3. Click and drag the content objects to the locations you want on the wall, or select an object on the Control Screen and press the Insert key.

4. For details about arranging content objects and adding different visual effects to each object, see Positioning and Sizing Content.

6.3.3 SHOWING MIXED CONTENT ON THE WALL

You can show different types of content objects on the wall at the same time. This allows you to mix graphics, video, computer screens, IP cameras, and more into one large display on the wall.
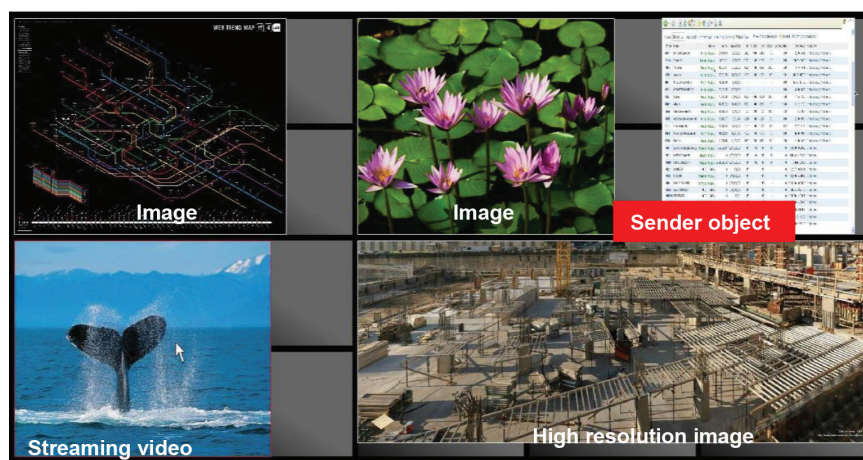
FIGURE 6-8. SHOW MIXED CONTENT ON WALL

After you show/open the content objects, you can arrange them to where you want them on the wall. For more information about arranging content objects, see Positioning and Sizing Content.

NOTE: For best results, do not show two or more different Radian Xd content objects or movies on the same Radian Xt UHD or HD Viewer monitor. If you show two or more different active content objects on the same Radian Xt UHD or HD Viewer monitor performance may be affected.

When the content objects are arranged where you want them, you can save the arrangement as a Radian Flex Environment to quickly access and reuse later. For more information about saving and using environments, see Showing Radian Flex Environments and the Radian Flex Environments section of Chapter 7.

To Show Mixed Content:

1. In the Control Panel, navigate to the Content List.

2. Select the content you want to show on the wall. Click the Show Selected button for each content object you want to appear on the wall.

3. Arrange the content objects as needed. For details about arranging content objects, see Positioning and Sizing Content.

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6.3.4 ADDING VISUAL EFFECTS TO CONTENT OBJECTS (ATTRIBUTES AND EFFECTS TABS)

Use the Attributes tab and Effects tab on the Control Panel to apply a variety of visual effects to content objects. In all cases, the effects apply to the active object selected in the Control Screen. The selected object changes from a white outline to a red outline.

1. Click on the Attributes tab in the Control Panel to move the slider for Transparency and Rotation, as shown in the following figure. The values vary from 0 to 100 for Transparency and -180 to 180 degrees for Rotation.
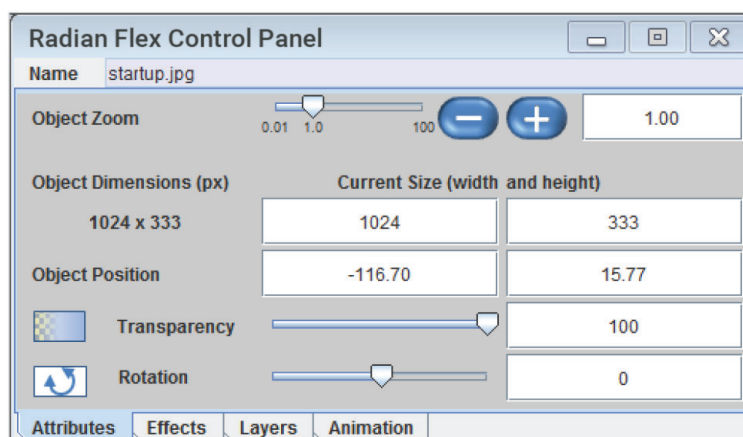
FIGURE 6-9. CONTROL PANEL

2. Click on the Effects tab in the Control Panel for the Red, Green and Blue color filters as well as the Black-and-White and Mosaic effects.

- For the color filters, 100 means that color is shown at full intensity, while lower values filter out that color more strongly as the value approaches 0.

- The Black-and-White filter makes the object more and more monochromatic as the filter value grows toward 100.

- The Mosaic filter breaks the image into larger blocks as the value grows to 100.
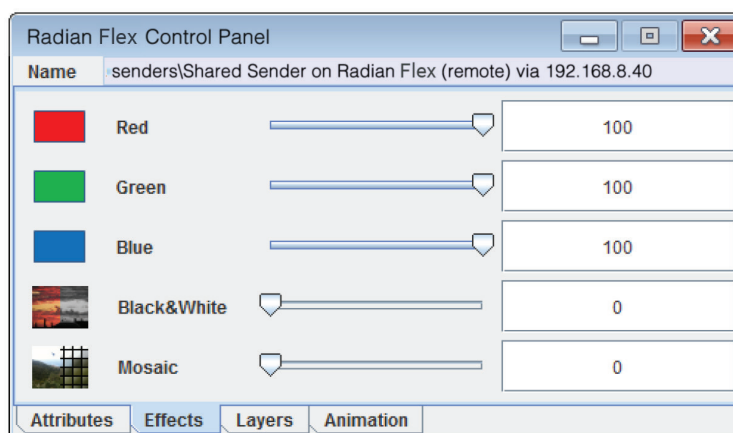
FIGURE 6-10. CONTROL PANEL SCREEN FILTERS

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6.3.5 CREATING AND MANAGING LAYERS (LAYERS TAB)

Each object is opened in a separate invisible layer on the wall. Objects on layers behind those of other objects may be obscured depending on the position and transparency of the objects in front.

Layering commands are provided by clicking on the Layers tab in the Control Panel, shown below. Click the buttons to move content in front of or behind content on other layers.
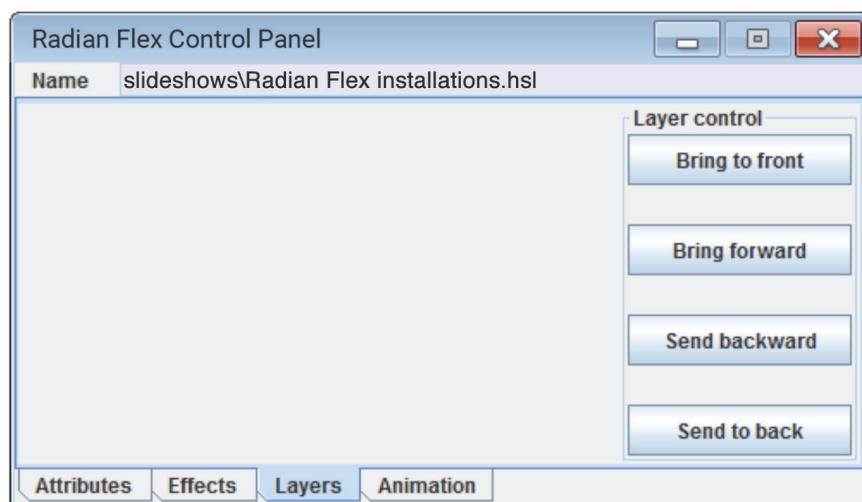
FIGURE 6-11. LAYERS TAB

Keyboard shortcuts can also be used to manipulate object layering. See the Keyboard and Mouse Commands.

Use layering information in Radian Flex Environments to make sure the restored environment looks just like it was intended when saved. For details on creating and using environments, see Radian Flex Environments.

6.3.6 CREATING AND SHOWING TEXT OBJECTS

Text objects are stored content objects created by the user. They can contain a single word or line of text up to multiple lines.

To create and edit text objects, click the "Create Text Object" button on the Control Panel. The "Create Text Object" button changes to "Edit Text Object" if a previously created text object is selected in the Content List.

The Text Object Manager window shown below allows the text object to be created, sized and colored, as desired.

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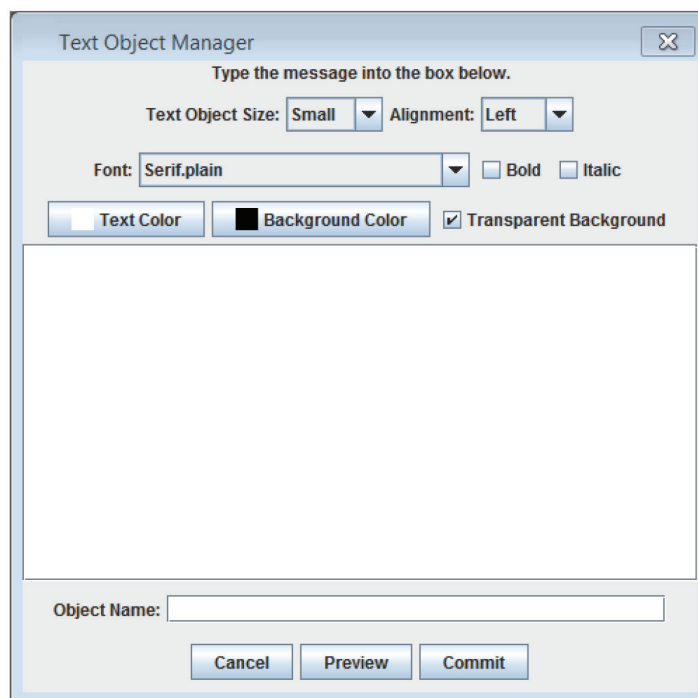
FIGURE 6-12. TEXT OBJECT MANAGER WINDOW

1. Use the Text Object Size selector to choose the size of the object. Small objects are made to act as a label for other objects on the wall, while Normal and Large objects can be used for text blocks or paragraphs. The Huge size is only intended for large walls with very high resolution (20 or more monitors, for example). Otherwise, the full resolution of the content object will not be usable.

2. If the text object contains more than one line, the Alignment setting allows right, left or center alignment of the text lines.

3. Below that, use the Font settings to choose the font to use from any available font installed on the system, as well as setting bold or italic. If the font has a bold or italic typeface, it is generally better to use that typeface rather than the Bold or Italic checkboxes.

4. The textbox where text is entered will reflect the chosen font.

5. Use the color buttons to select the Text Color and the Background color. If Transparent Background is checked, the Background color will only be used to help with anti-aliasing (smoothing) of the text, but will not otherwise be shown.

6 The Preview button shows a small representation of what the final text object will look like, as shown below. A transparent background is shown by a checkerboard pattern.

7. Text objects have a maximum size set by the Text Object Size setting, then the font size is chosen automatically to fill as much of that chosen size as possible. Therefore, the user does not directly choose a font size, but rather tailors the object size to be how large it needs to be on the wall. Once the text is drawn within the specified boundaries, its background is cropped so the object size and the text it contains are well matched.

8. A text object needs a name – enter the name into the Object Name field, though the field is not changeable when editing a text object (use the Content Manager to rename or move text objects).

9. Press the Commit button to create the object in the top level of the content folder denoting it is a PNG graphics file with some associated metadata containing the text for later edits.

The Text Object PNG file can be shown on the wall like any other image, and it can be moved to a subfolder using the Content Manager. Because of the metadata, the text in the object can be changed and the object will be recreated and distributed to the Radian Xt UHD or HD Viewer computers when the "Edit Text Object" button is used.

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6.3.7 SHOWING RADIAN FLEX SLIDESHOWS

A Radian Flex Slideshow can include a mixture of stored content objects and just-in-time content objects shown in sequence.

If the content objects are not the same size, the area around the smaller objects is shown as black on the wall, if you select to maintain aspect ratio. You can also clear aspect ratio to allow the content objects to stretch to fill a space. Go to Chapter 7 for how to create slideshows.

After you create and save a slideshow, you can show multiple copies of the slideshow on the wall at the same time. There is no specific limit to the number of saved slideshows.

NOTE: A Slideshow cannot include another Slideshow or an Environment. However, an Environment can include Slideshows.

6.3.8 SHOWING RADIAN FLEX ENVIRONMENTS

Radian Flex Environments let you create a wall layout using any content objects and then save that layout for future use. This saves you time, as you do not need to recreate a wall display in the future. Use the Radian Flex Scheduler to have your environments run at pre-set times.

Environments save information about the content objects, such as which content objects, placement, and other settings.

There is no specific limit to the number of saved environments. You can show one or more environments on the wall at the same time. Typically, you show one environment at a time but you can combine them.

If you manually open multiple copies of a slideshow, they may appear out of sync. If they are out of sync, then they will stay out of sync by the same amount of time for as long as they appear on the wall, creating interesting visual effects. To synchronize the start time of slideshows, use an environment to start them at the same time.

After you create and save an environment, you are ready to use it.

To Use a Radian Flex Environment:

1. Open the Control Panel and navigate to the Environments folder in the Content List.

2. Select the environment you want to use and click Show Selected.

3. At the prompt, click Yes to clear the wall or No to overlay the environment over any content currently being shown on the Radian Xt UHD or HD Viewer displays. The selected environment appears on the wall. If a content object in the environment is not available, you are prompted with a warning.

You can lay an environment over content already appearing on the wall.

6.4 POSITIONING AND SIZING CONTENT

After you place content objects on the wall, you can change how and where they appear on the wall in several ways.

1. You can click and move content on the Control Screen with your mouse. The content will also move on the Radian Xt UHD or HD Viewer displays.

2. You can position, size, and create effects on content more precisely with settings and preferences menus in the Control Panel. Use the sliders, fields, and buttons to create the look you want for your content. See Table 4-1, next, and the Using the Control Panel and Control Screen section earlier in this chapter.

3. For more options to precisely move content on the Control Screen, also review the section on Keyboard and Mouse Commands.

6.4.1 SELECTING AN OBJECT ON THE CONTROL SCREEN

When you select a content object on the Control Screen, the content changes from a white outline to a red outline. Changes made on the Control Screen show up on the display wall.

TABLE 6-1. CONTROL SCREEN CHANGES

TO…	DO THIS…
Clear the wall of content objects	In the Control Panel, click the Clear Display button.
Change the color of a content object	Select a content object. At the top of the Control Panel, move the color sliders to the colors you want. You can also specify exact percentages of colors.
Change the transparency of a content object	Select a content object. At the top of the Control Panel, move the Transparency slider to the level of transparency you want. You can also specify an exact percentage of transparency.
Enlarge the content object to one or more predefined boundaries	Select a content object and place the object in one or across several display monitors. Do one of the following: • At the top of the Control Panel, select the Maintain Aspect Ratio check box. Double-click the content object. The content object appears across the monitors, maintaining aspect ratio (the ratio of width to height of an object). • If the object is short and wide, it expands to full width. It top or bottom justifies across the monitors, depending on whether it was above or below center when double-clicked. If the object is tall and thin, it expands to full height and then left or right justifies, depending on whether it was right or left of the center of the monitor set when double-clicked. Position and size the content object where you want but slightly smaller than the area you want it to fill. Then double-click and it fits to the area. • At the top of the Control Panel, clear the Maintain Aspect Ratio check box. Double-click the content object. The content object stretches to fill the complete screen of every monitor that displayed any portion of the content object before you double-clicked it. The content object may distort; for example, circles may not be round or people may become short and squat or tall and skinny. This can create interesting visual effects.
Make the content object larger or smaller	Larger: Select the content object. Right click and drag the mouse to up or right, as shown by the cursor. Smaller: Select the content object. Right click and drag the mouse down or left, as shown by the cursor. Use the Current Size area in the Control panel to specify exact sizes or the Object Zoom area to specify exact zoom percentages.
Move content object on the wall	Click the content object and drag it to the new location. Use the Object position area in the Control panel to specify an exact position.
Move all content objects on the wall at the same time	Ctrl+click and drag all content objects to the new location.
Place a content object on the wall	In the Control Panel, locate the content object to place. Click the Show Selected button.
Remove a content object from the wall	Click a content object. In the Control Panel, click the Close Selected button.
Rotate a content object	Click a content object. In the Control Panel, use the Rotation slider to set the rotation of the content object. You can also specify the exact amount of rotation.
Show or hide the cursor on the wall	Specify if the cursor on the Controller should appear on the wall when you are moving and interacting with content objects. It can be useful to show the cursor to your audience, for example, during a presentation. Open the Settings dialog box to change this setting.

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6.4.2 KEYBOARD AND MOUSE COMMANDS

Both the Control Screen and Radian Xc — ControlBridge Operator have a number of keyboard and mouse commands that give very precise control to manipulate objects on the Radian Flex System.

To use these keyboard and mouse commands, make sure the Control Screen or Radian Xc — ControlBridge Operator window is selected, then select an object and use the options in the following tables.

TABLE 6-2. MOUSE COMMANDS

MOUSE	DESCRIPTION
Left-click	Select the object
Left-click and drag	Move the object
Right-click and drag	Increase or decrease the size of the selected object
Mouse wheel	Increase or decrease the size of the selected object
Mouse wheel ctrl	Increase or decrease the zoom level of the magnifying window when it is enabled
Left-double-click	Snap the object to the grid
Right-double-click	Start the Radian Xs (KVM) control mode on the selected Radian Xd.Sender content object (not available on Radian Xc — ControlBridge

TABLE 6-3. KEYBOARD COMMANDS

KEY	DESCRIPTION
Insert	Duplicate (show again) the currently selected object
Delete	Close the selected object from the control screen
Arrow keys	Move the selected object up, down, left, or right by about 5% of width or height of the object
Arrow keys ctrl	Nudge the selected object up, down, left or right by a pixel
Arrow keys Shift	Nudge the selected object up, down, left or right to the next snap boundary
~	Snap, maintain aspect ratio
~ shift	Snap, fill region
+ and -	Increase or decrease the size of the selected object by 10% of the original image height
+ and - ctrl	Increase or decrease the size of the selected object by one pixel
+ and - shift	Rotate the selected object clockwise and counter- clockwise by 15 degrees
+ and - shift ctrl	Rotate the selected object clockwise and counter- clockwise by one degree
Home	Send the selected object to the front
End	Send the selected object to the back
Page Up	Move the selected object one layer forward
Page Down	Move the selected object one layer backward
Tab	Select the next object one layer forward
Tab shift	Select the next object one layer backward
H	Brings up this list of commands (Control Screen only)

6.4.3 CLICK-AND-DRAG OBJECTS TO ROTATE AND RESIZE

Radian Flex Software supports click-and-drag object resizing and rotation. You can click-and-drag directly on any object in the Control Screen. This is an intuitive way to quickly and easily manipulate a content object to a desired size, shape, or rotation.

To make an object wider or narrower, changing the aspect ratio, click and drag the adjustment points at the sides of the object.

To simultaneously adjust both the width and height of an object, keeping the aspect ratio the same, click and drag the corner adjustment points.

To maintain the object's original aspect ratio, hold down the <shift> key as you click and drag the adjustment points.

The object's layering is preserved as you resize it.

To rotate the object clockwise, click and drag the rotation point to the right. To rotate counter-clockwise, click and drag the rotation point to the left.

Click-and-drag resizing and rotation gives you a quick and efficient way to manage your Radian Flex content.

6.4.4 OBJECT MULTI-SELECT WITH KEYBOARD AND MOUSE

Radian Flex Software has the ability to multi-select objects on the Control Screen to manipulate the objects as a group. Use these mouse and keyboard commands to manage a group of objects quickly and speed up getting your tasks done:

1. To multi-select a group of objects, hold down <ctrl> and click on the desired objects in the Viewer Window. Or, click-drag a rectangular area that encompasses the desired objects to manage. Objects "captured" in the group are highlighted in light-gray.

2. At this point, mouse and keyboard key controls are used to manage the objects. To see a list of these key controls, click 'H' on the Controller.

3. Move the group of objects by clicking and dragging with the mouse. You can also use the left and right arrow keys on the keyboard.

4. Resize the group with the mouse's scroll wheel or click on the + and – keys on the keyboard.

5. Individually rotate a group of objects to the same angle at once using the <shift> + or <shift> – keys.

6. Delete a group of objects either by clicking 'Close Selected' or by pressing the DEL key on the keyboard.

Object multi-select gives you a quick and efficient way of managing your Radian Flex content.

7. FAULT TOLERANT OPTIONS WITH FLEX PRO

The Radian Flex Pro can have two control points, or Controller computers, to provide fault tolerant operations. Each Controller computer can control the Radian Flex System. When there are two Controllers, one Controller is always in Shadow Mode, ready to step in to keep the Radian Flex System running if there is a disruption to the primary Controller. If one Controller's operation is disrupted, the second Controller will continue to work and manage the display wall and content sources. The two Controllers synchronize content during regular operations. The Radian Flex Standard has one Controller computer.

7.1 EVENTS TRIGGERING FAULT TOLERANT INTERVENTION

1. The Radian Flex Pro is designed to tolerate several failure modes: Common scenarios include someone powering off a Controller computer or pulling its plug, a disconnected Ethernet cable, accidental removal of the Radian Flex USB drive, which has the Radian Flex software license on it, and hardware failure and overheating of the Controller computer.

2. In addition, regular tasks, such as system maintenance and operating system updates, or even a user logging off a Controller computer, will not significantly disrupt or prevent proper operation of the Radian Flex Pro.

By having a redundant, Active-Active pair of Controllers, the Radian Flex Pro system is able to tolerate many failures.

The requirement for entering into fault tolerant mode is that at least two of the three USB licenses (in the two Controller computers and the Key Node computer) are present and the software is operating. Therefore, the Radian Flex fault tolerant system will work normally if one of the Controllers is offline or if the Key Node is offline while the two Controllers are operational.

7.2 SHADOW MODE

When both Controllers are operational in the fault-tolerant Radian Flex Pro, one of them will show that it is in "Shadow Mode" in the title bar of both the Control Panel and Control Screen.

"Shadow Mode" means that the Controller is deferring many operations to the other Controller, but it is still fully capable of opening, closing and manipulating objects on the display wall, importing content and creating slideshows, animations and environments.

There are very few system maintenance activities that are restricted from a Controller in Shadow Mode, but warnings will be shown if needed. In general, however, the two Controllers can be considered as equals.

In regular operation, if a user on one Controller moves an object on the wall, that movement will show up on the wall and on the other Controller. If a user imports an image, that image will be made available on both Control Panels. If a user opens a Streamer on the wall, that Streamer will be shown on both Control Panels and the display wall.

The software Radian Xs or KVM (Keyboard-Video-Mouse) operations for Radian Xd software can be performed on either Control Panel. While only one Control Panel can KVM a particular object at a time, the other Control Panel can KVM a different object simultaneously.

Some other operations are restricted so that only one Controller at a time can perform them. These include manipulating system settings and importing content. Simultaneous editing of a particular slideshow is not permitted, though different ones can be edited at the same time.

When the Radian Flex Scheduler is started on one Controller, it also shows up as running on the other one, because the scheduler manages the contents on the wall. In general, Radian Flex Pro gives two users the ability to simultaneously manage the display wall.

7.3 TIMELINE OF FAULT DETECTION AND RECOVERY

If one of the Controller computers for the Radian Flex Pro disconnects (for whatever reason):

1. The shadow Controller computer will control the display wall and allow normal operation.

2. There may be a brief period of transition as network connections are re-established and the state is properly recovered, but timing is maintained through the transition period, so animations, slideshows and movies will retain their original timing once the recovery is complete.

CHAPTER 7: FAULT TOLERANT OPTIONS WITH FLEX PRO

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Depending on whether the failure is orderly or not, the recovery period can last from less than a second to around ten seconds:

1. Orderly disconnections include quitting the Controller software, shutting down a Controller computer, or removing the USB drive holding the Radian Flex software license. In these cases, the remaining components of the Radian Flex Pro are immediately aware of the disconnection, so network reconnections are quick and recovery can be very fast.

2. Uncontrolled failures, like a network cable being pulled, the computer overheating or "blue screening," or the power plug being tripped over, require more time for the remaining components of the Radian Flex Pro to determine what happened and how to recover. In this case, the recovery time will be a few seconds, and perhaps more time will be needed for some Radian Xd sources to reconnect.

In any case, the state will be recovered and all sources will be restored to the display wall when they reconnect.

During the transition period, animations and slideshows may stop or appear jerky, however, as discussed earlier, their timing will be maintained, so they will remain synchronized after the recovery.

During the transition period, dynamic content from Radian Xds may stop, stutter or even temporarily disappear from the wall until network connections are reestablished. As soon as the network connections are reestablished, these sources will be restored to the display wall and behave normally. This may take several seconds, particularly for the Radian Xd Sender, which may need to renegotiate its SSL-secured connection.

7.4 SYNCHRONIZING CONTENT AND SETTINGS

Under regular fault tolerant operations, when two Controllers are running, content import operations (from the Manage Content button on the Control Panel) automatically synchronize between the two Controllers, no matter which Controller computer initiates the import.

Many settings are shared between the two Controller computers in the Radian Flex Pro, so changing a setting on one Controller will propagate the change to the other one.

1. Examples include the contents location on the Radian Xt UHD or HD Viewer Computers, as well as visible settings such as the SmartFrame and natural vs. full view mode.

2. Other settings that are specific to a particular Controller computer, such as the local contents directory location, diagnostic telemetry display, or cursor color, are private and not shared with the other Controller computer.

If one of the two Controller computers was offline for any reason, take these steps to manage content between the two Controllers:

1. An offline Controller will not have any static content (images and movies) that was imported or created (environments, slideshows and animations) while the Controller was offline. Clicking the Manage Content button in the Control Panel will warn that content changes will not occur on the disconnected Controller computer, but the user has the option to perform them anyway.

2. Once the previously offline Controller is brought back online, click the Synchronize Display Contents button on the Controller that was working, and the content will be pushed from it to the reconnected Controller. Clicking the Synchronize Display Contents button will also synchronize contents to any Radian Xt UHD or HD Viewer displays/computers that were offline at content import time.

Get to the Synchronize Display Contents button by clicking on the Settings … button on the Control Panel and then clicking on the System Setup tab.

8. RADIAN XD AND FLEX CAST

Radian Xd and Radian Flex Cast —Source Remote Broadcasting software is about the here and now. Content created with Radian Xd is not imported and stored ahead of time – use Radian Xd software for dynamic, just-in-time content, delivered as soon as it is created, over the network or across the Internet to your Radian Xt UHD or HD Viewer displays.

Radian Xd software has three components – Streamer, IP Streams, and Sender.

Radian Xd content includes desktop captures from PCs, video feeds, IP camera streams, and streaming movie playback. Use Radian Flex Cast to share Radian Xd desktop Sender content with multiple Radian Flex Systems. Use Radian Xm KVM Control for keyboard and mouse control of Radian Xd computers.

Interacting with Radian Xd content enhances communication and collaboration in groups of any size.

8.1 RADIAN XD AND RELATED SOFTWARE

Radian Xd software has three components – Streamer, IP Streams, and Sender.

Radian Xd Streamer and Radian Xd IP Streams software is designed to provide high frame rate feeds to the video wall. Streamer software can import video from any external source using ordinary video capture cards, giving you the ability to view feeds from video conferencing systems, media players, cameras, and desktop screen capture. The IP Streams software consists of a camera management tool and media engine for streaming IP cameras and RTSP sources to your video wall.

Radian Xd Sender software allows you to view on the video wall almost any application running on any computer from anywhere. Radian Flex Cast —Source Remote Broadcasting software, an option, shares Sender content between multiple Radian Flex Systems, even in different facilities around the world.

Radian Xm is also known as KVM or Keyboard-Video-Mouse. This option allows the Flexibility of keyboard and mouse control of Radian Xd computers through the Controller or Radian Xc — ControlBridge Operator computers.

Before installing Streamer and IP Streams software, make sure your graphics drivers are fully up-to-date by downloading them from the GPU vendor's website and installing them. The drivers provided by Microsoft® or through Microsoft update are typically not acceptable and may prevent proper Streamer functionality and performance. Do not use Microsoft Remote Desktop Protocol (RDP), which may disable functionality. Refer to installation instructions in Chapter 3.

8.2 RADIAN XD STREAMER

Radian Xd Streamer software is intended for fast-moving video content, input from capture devices and attached cameras, and high frame rate desktop capture streaming.

- Stream one or more displays or screen regions via desktop capture
- Stream video-based content from external devices, such as a digital camera, DVD player or TV tuner connected to the Streamer computer through DirectShow-compliant video capture cards
- Stream video from DirectShow-compliant attached cameras (webcams)
- Stream video from movies (WMV, for example) playing on the originating computer

The Streamer in Radian Flex increases the performance and efficiency of streaming content. This Radian Flex software offers very high quality streaming and significantly reduced bandwidth. This advanced Streamer requires a 64-bit Windows Operating System, runs on machines with a modern Intel CPU, and takes advantage of NVIDIA GPU for hardware acceleration.

In the Streamer software, most settings and options are per-stream, as discussed in the section, Configuring the Streamer Settings (Options Panel). Configure your settings appropriately for your desired content.

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8.2.1 MAIN MENU – SELECT THE STREAMER SOURCE

Before you can select streaming content on the Controller, you must select it on the Streamer.

1. Check that the Controller software is running on the Controller computer and start the Radian Xd Streamer software.

If the Controller software is not running, or if the Streamer software cannot contact the Controller, the Streamer displays a window showing that it is not connected to the Controller. Check that the Controller software is running on the Controller computer and that the Streamer computer is on the Radian Flex network.
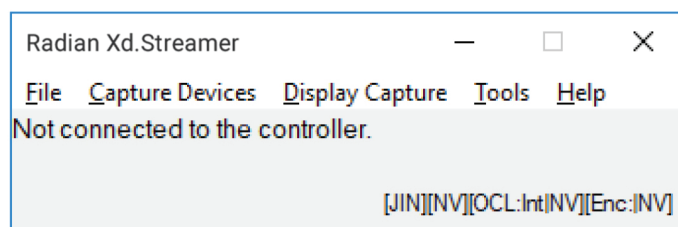
FIGURE 8-1. RADIAN XD STREAMER SCREEN, NOT CONNECTED

2. Select the source. Once the Streamer is connected to the Controller, the window changes. The window lets you select the Streamer source.
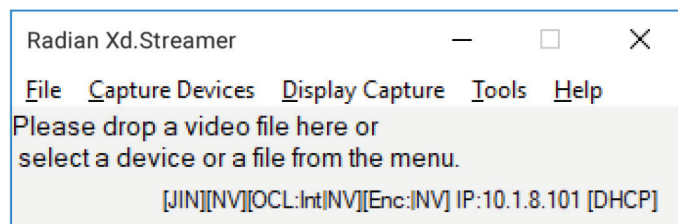
FIGURE 8-2. RADIAN XD STREAMER SCREEN, SELECT SOURCE

There are four ways to start a stream:

- Streaming a WMV file across the network
- Streaming from a device such as a webcam or a DVD player connected to a capture card in the Streamer computer
- Streaming from a capture card input
- Streaming the contents of the PC's display.

3. To stream a WMV file across the network to the wall, click Open File on the File menu. Browse and select the WMV file. Click OK, or drag a WMV file onto the Streamer window, shown next.

CHAPTER 8: RADIAN XD AND FLEX CAST

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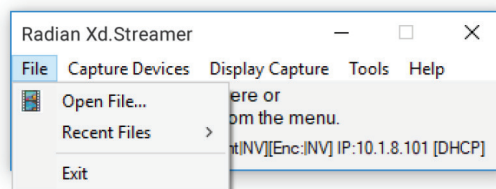
FIGURE 8-3. RADIAN XD STREAMER SCREEN, OPEN FILE

4. To stream from a device such as a webcam or a DVD player connected to a capture card in the Streamer computer, click the Capture Devices menu option. Browse the available devices, and then select the device at the desired resolution and frame rate. Click OK.

FIGURE 8-4. CAPTURE DEVICES MENU

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5. Use the Customize… selection in the Capture Devices menu to set custom resolution and frame rate, if needed.

The window that pops up shows the name of the card and any configured custom resolution settings. These can be Edited or Deleted using the buttons below the list. New settings can be added.

The capture Width, Height, and Frames Per Second (FPS) can be set in both the Add and Edit Resolution boxes. The Width and Height values must each be a multiple of four. Available FPS settings are shown in the pop-up list.
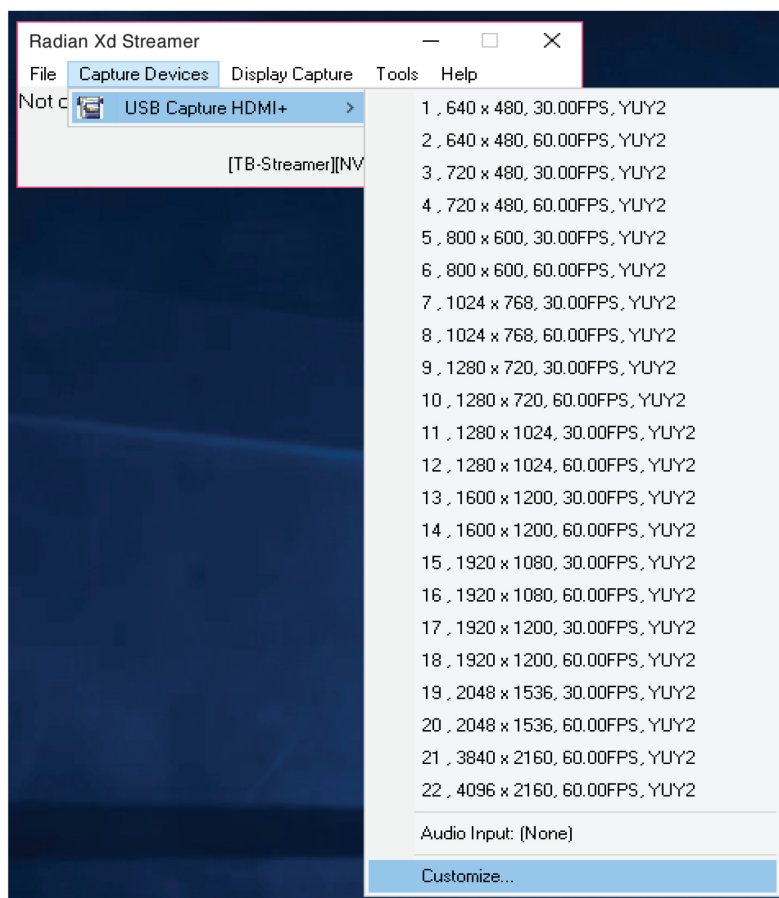
FIGURE 8-5. RESOLUTIONS

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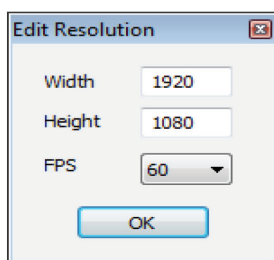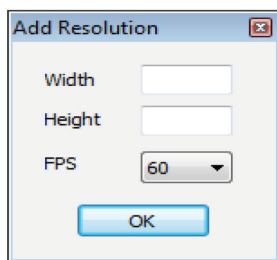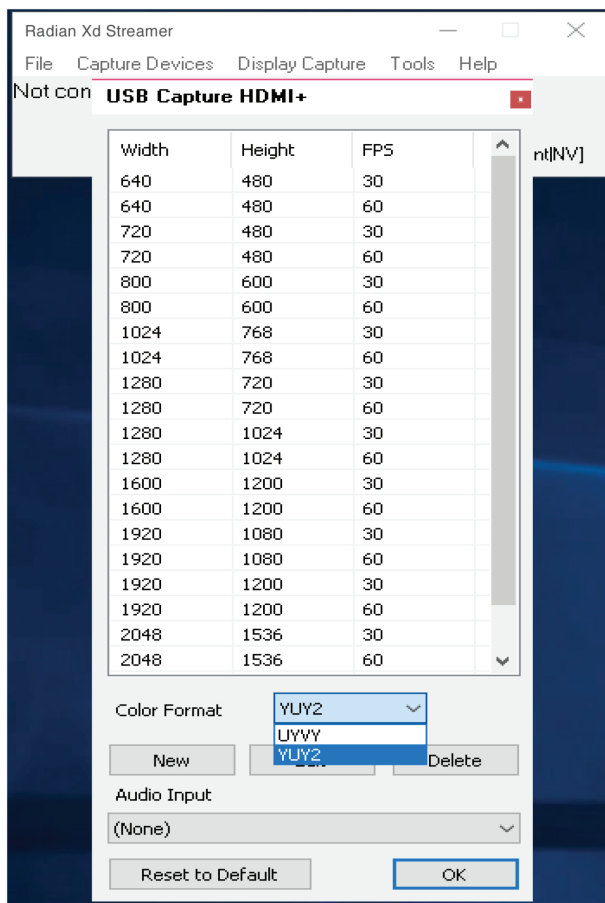
FIGURE 8-6. RESOLUTIONS

FIGURE 8-7. WARNING MESSAGE

The next example shows the Streamer preview window for content streaming from a capture device. In this example, the preview window shows Stream 11 from a DirectShow-compliant camera streaming to the Radian Xt UHD or HD Viewer displays at 1920 x 1080 and 30 Frames Per Second.

FIGURE 8-8. STREAMER PREVIEW WINDOW

Click on the gear icon button on the lower right corner of the capture device preview window to reach the Options Panel. Go to the Options Panel for performance options as well as the check boxes to flip the horizontal or vertical display of content and synchronize the audio.

 6. To stream the contents of the PC's display, choose a display device from the Display Capture menu.

The Display Capture menu shows options to send each display separately or send all displays. In addition, parts of the screen can be captured rather than an entire display. These are called Capture Windows and are created and managed via the Manage Capture Windows… panel in the Display Capture menu.
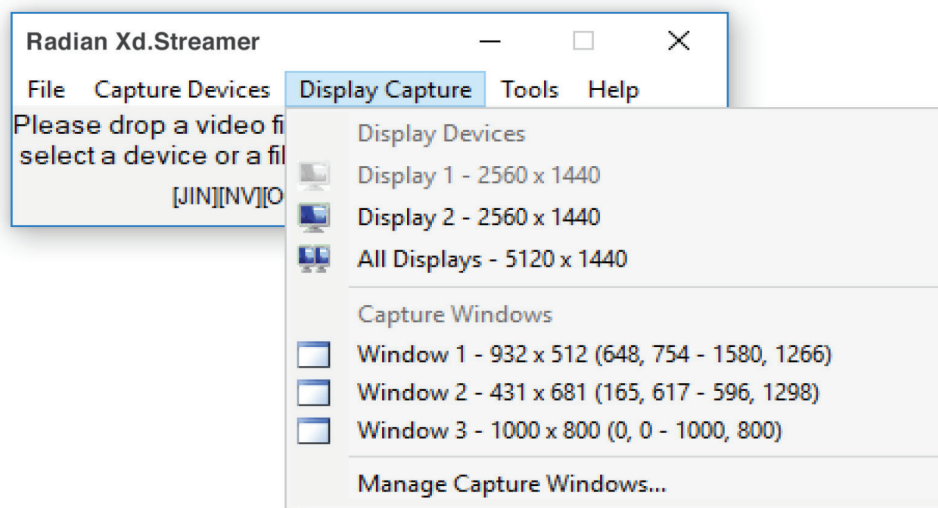
FIGURE 8-9. DISPLAY CAPTURE MENU

Select "Manage Capture Windows…" to see a list of any current capture windows and to create new capture windows, delete them, and to open a selected one to resize it.
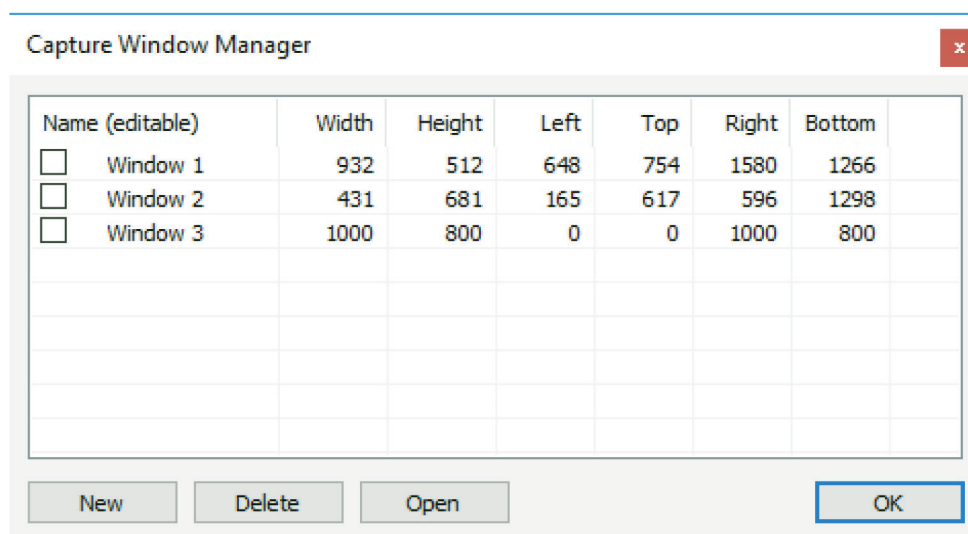
FIGURE 8-10. CAPTURE WINDOW MANAGER

Creating a new capture window or opening an existing window pops up a partially transparent window. Move the window over a region of interest to designate the size and position of the capture window.

If a capture window is currently shown on the display wall, the size of the capture window cannot be changed, though the position can. The Capture Window Manager and transparent Capture Window show locks for values that cannot be changed.

Once a stream is created, a small window shows the name of the stream and a preview of the content.

For desktop capture windows, shown next, you can change the frame rate by moving the throttle slider on the bottom of the Stream's preview window. Experiment with the throttle slider to see if moving the slider improves the performance of streaming content on the wall. The example, below, shows a desktop capture preview window from Display 1 streaming content at 2560 x 1440 with a frame rate of 5 FPS selected.

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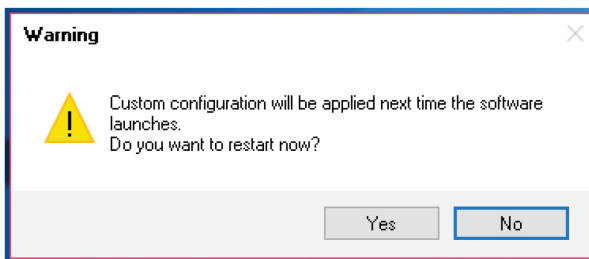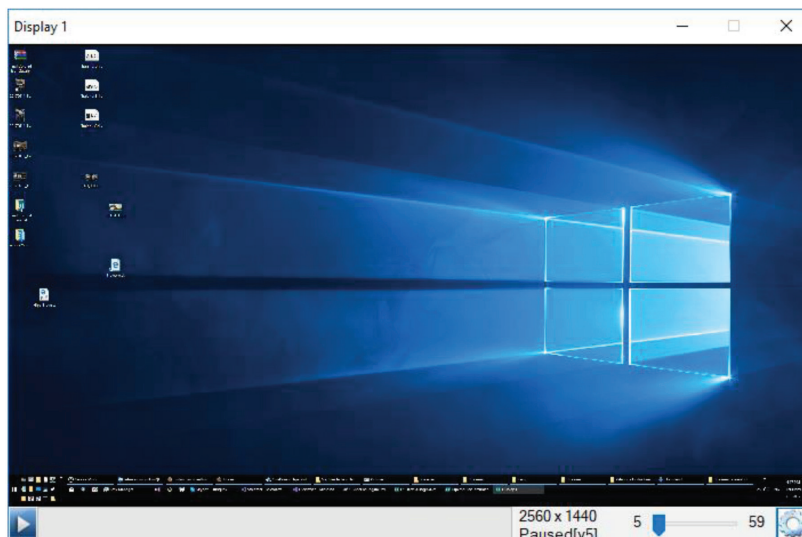FIGURE 8-11. DESKTOP CAPTURE WINDOW

Click on the gear icon button on the lower right corner of the Stream's preview window to reach the Options Panel. Go to the Options Panel for performance options as well as the check boxes to flip the horizontal or vertical display of content, synchronize the audio, and turn on Radian Xm for keyboard and mouse control (KVM).

8.2.2 CONFIGURING THE STREAMER SETTINGS (OPTIONS PANEL)

Use the Options Panel to configure each content stream for performance and efficiency. There are settings for performance, audio delay, cursor type, and Radian Xm, the Radian Flex capability for keyboard and mouse control (KVM).

1. On the Streamer computer, go to the stream's preview window and click on the gear icon button in the lower right corner. This brings up the Options Panel.

2. Advanced Encoding – This option is available if you do not select Legacy Encoding. Advanced Encoding takes effect for newly created streams only.

Turning on HWV Encoding is highly recommended. Select HWV Encoding to use Radian Flex's high-quality, low-bandwidth streaming capability. HWV Encoding requires a powerful computer with a recent (CUDA-capable) NVIDIA graphics card and a modern Intel processor.
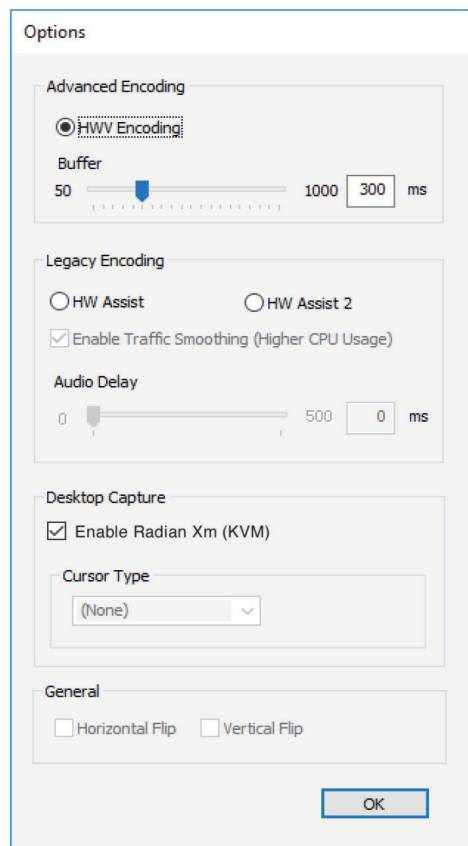
FIGURE 8-12. ENCODING OPTION

The buffer slider shows the buffer size. The default value for the buffer in HWV Encoding is 300 milliseconds. Avoid changing this value unless your streams are missing frames (as shown on the Radian Xt UHD or HD Viewer displays).

Missing frames usually indicate heavy network traffic (other than Radian Xd Streamer) or the video wall is being overloaded with too many tasks, such as the display of too many videos, for the performance capabilities of the computers and network.

If you experience some missing content on the video wall, increase the buffer value to accommodate missing frames. With HWV Encoding selected, move the slider to adjust the buffer from 0 to 1000 ms. Moving the buffer slider to the left, closer to 50 ms, reduces lag, but if the buffer is too small, the entire frame will not be received. If the buffer is too small, move the buffer slider to the right, closer to 1000 ms, until you reach the most effective buffer size for your content.

When HWV Encoding is enabled, the Streamer will show a preview window of the stream being sent. If your Streamer machine does not meet the hardware requirements, HWV Encoding will not be available.

3. Legacy Encoding – This option is available if you do not select HWV Encoding. Legacy Encoding takes effect for newly created streams only.

Use Legacy Encoding if your Streamer machine does not meet the requirements for using Advanced Encoding.

If the Streamer machine has a recent (CUDA-capable) NVIDIA graphics card or a modern Intel processor, the Streamer will use hardware assist (HW Assist) to significantly reduce the required network bandwidth and enable higher resolution streaming.

The other option, HW Assist 2, increases the streamed video quality at the expense of higher network bandwidth. HW Assist 2 also requires a recent NVIDIA GPU or a modern Intel CPU.

The Streamer will show a preview window of the stream being sent when using Legacy Encoding.

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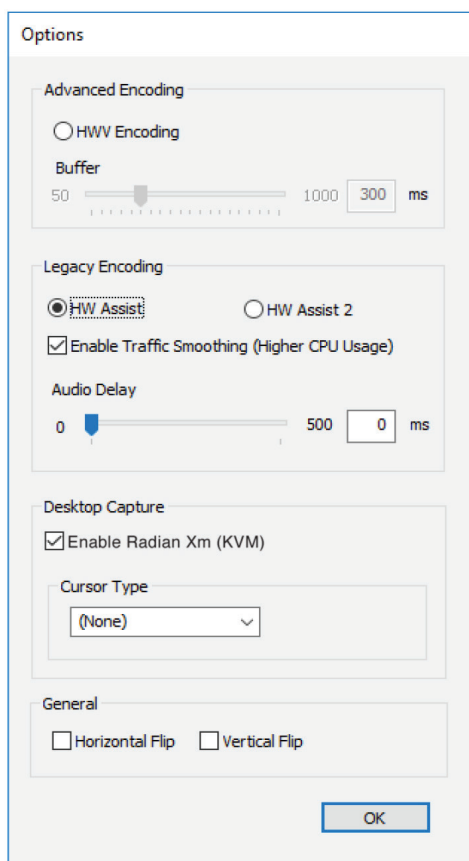
FIGURE 8-13. PREVIEW WINDOW

When selecting HW Assist or HW Assist 2, clicking the traffic smoothing checkbox may improve performance. Traffic smoothing reduces dropped network packets, but has higher CPU usage and is designed for higher performance Streamer machines.

4. Audio Delay – Because capturing a video stream, sending it over the network, and displaying it on the wall are not instantaneous, the audio from the stream will be heard before the matching frame is displayed.

You can set the Streamer to delay playback of the audio by several frame times to match it with the appearance on the display wall. Move the slider from 0 to 500 milliseconds to precisely modulate the audio delay for your content. The Audio Delay option affects newly created streams and open streams.

5. Enable Radian Xm (KVM) – The Enable Radian Xm (KVM) checkbox allows users to control the keyboard and mouse of the Streamer PC via Desktop Capture (including Capture Windows).

6. Cursor Type – Show the computer cursor position from the Streamer computer on the video wall. If set to "None," the cursor position is not shown (for privacy or to eliminate distractions). Other settings, including laser pointer-like settings, will show the local cursor position in the streamed capture window on the Radian Flex.

7. Horizontal Flip and Vertical Flip – Selecting either of these options flips the streamed content on the video wall along the chosen axis.

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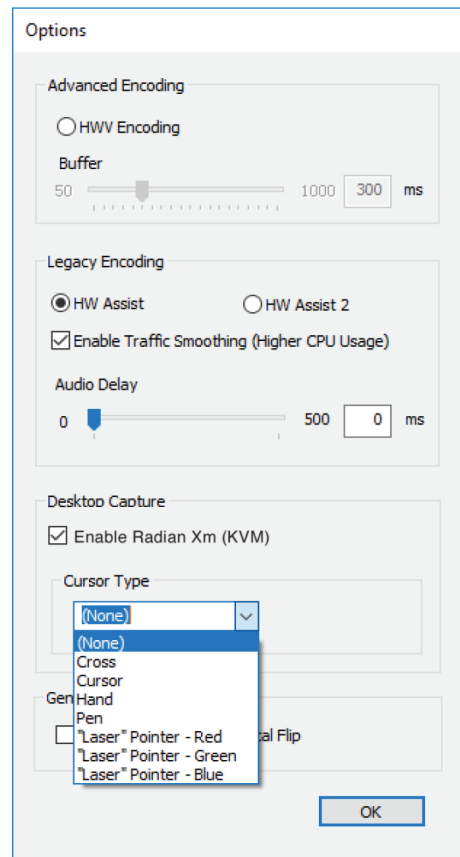
FIGURE 8-14. CURSOR TYPE DROPDOWN MENU

8. General – Located at the bottom of the Options Panel, check the appropriate box to flip streamer content vertically or horizontally.

8.2.3 RENAMING STREAMER (AND DISPLAY) DEVICES

Streamer devices (capture devices and display devices) can be renamed from the Tools menu to make them more descriptive for users.

For example, a capture device can be renamed to show the video source, as shown next. As a result, the capture device is renamed to Cable TV. Display devices can also be renamed as shown next. This is useful in multi-monitor systems. After the rename operation, the menu choices reflect the new names.
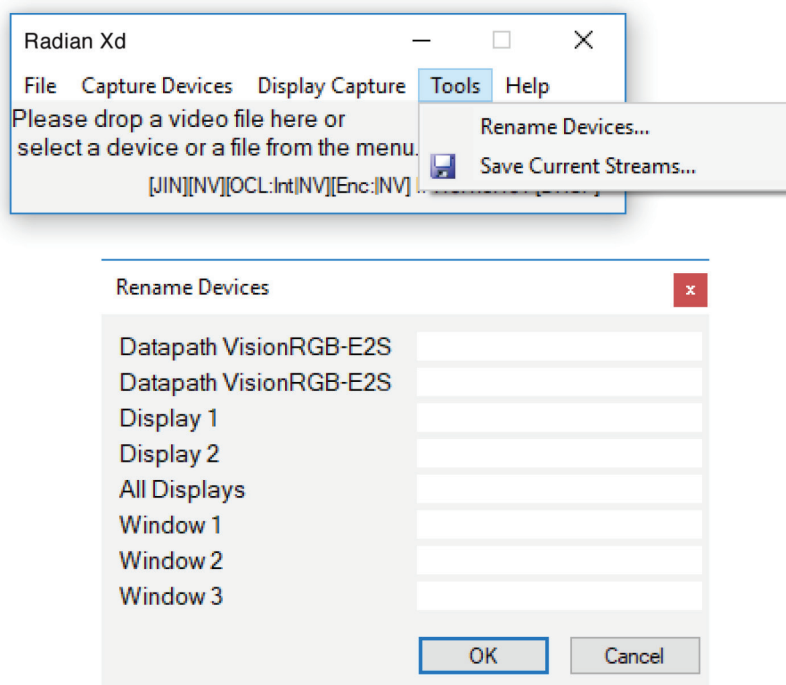
FIGURE 8-15. RENAME DEVICES

8.2.4 SHORTCUT FOR AUTOMATIC STREAMER STARTUP

The Streamer has an easy way to automatically start a Streamer. Make this shortcut when installing Streamer software or at any time when adding Streamers.

Go to the Tools menu and select the Save Current Streams selection, shown in the above figure. This will capture the currently available streams into a Windows shortcut that can be used to start the Streamer in the chosen state. Add the shortcut to the Startup Folder to automatically start those Streamer sources upon system startup.

8.2.5 STREAMER MOVIE FORMATS

By default, the Radian Xd Streamer can stream WMV movie files. It is possible to install on the Streamer node FFDShow or other codec and filter packs to allow DirectShow to decode different movie types. While Radian Flex software does not support this installation of third-party add-ons, they have been shown to work in many cases.

NOTE: Only install these add-on packs on the computers running Radian Xd Streamer software, not the computers running Radian Xt UHD or HD Viewer software.

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8.3 RADIAN XD IP STREAMS SOFTWARE
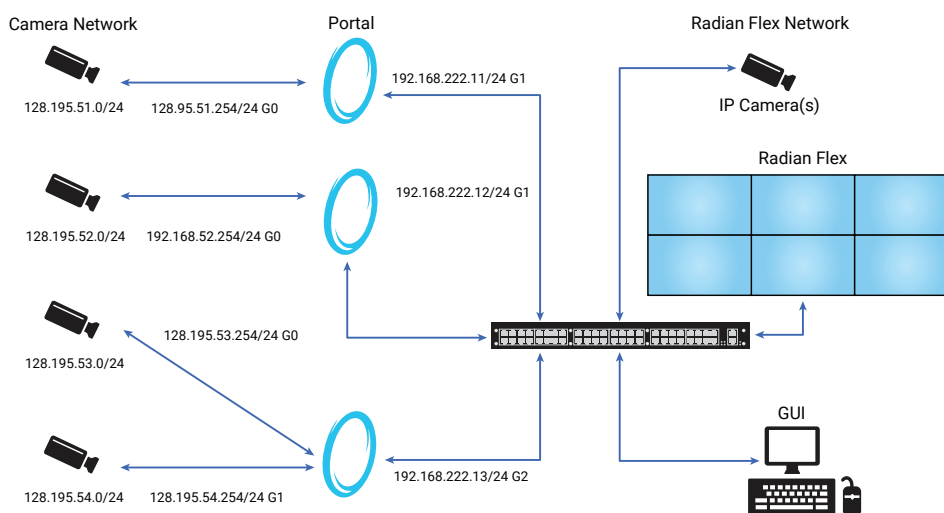
FIGURE 8-16. IP STREAMS EXAMPLE

The IP Streams software consists of a camera management tool and media engine. The camera management tool provides a user interface to interact with the software, manages the IP cameras and RTSP sources, and commands the media engine.

When a user selects a video stream on the IP Streams software and registers the video stream with the Controller, the camera management tool issues a command to the media engine to warm up the video stream connection. The media engine fetches video data from the IP camera and streams it to the display wall.

The IP Streams software communicates with IP cameras via the ONVIF protocol. Using this protocol, the IP Streams software gathers detailed information about the IP camera, such as camera model, available video streams, and the video resolution and connection string for each video stream. With this level of technical detail, you can decide which camera or source profile best fits your purpose and select the best profile for your purpose.

CONFIGURING AND USING IP STREAMS

1. Add IP cameras and RTSP sources to the IP Streams main window. There are two ways to do this:

In the Camera/RTSP stream Information area, key in the address, username, and password into the open fields. Click the Add Source button.

◆ Depending on the number of cameras, it may be faster to click the Import button. Clicking Import brings up a window to add IP cameras and sources in CSV (comma-separated values) format. The format of the CSV file for import operation is: Address of the camera, login name, login password. Every line in the import operation is another camera. For example:

http://10.1.1.25,username,password

http://10.2.2.30,username,password

2. The IP Streams software automatically sorts cameras and sources into the two lists. Click on the IP Camera tab to see IP cameras and click on the IP Source tab to see RTSP sources.

3. Click the Show Details check-box to see camera and RTSP source profiles. Profiles are listed below the names of the cameras and sources. There can be multiple profiles for each camera or source.

4. The Information String column on the IP Streams main window identifies each IP camera or IP source. The information string is a name that combines the type of source – IP Camera or IP Source – followed by the IP address.

There is the option to assign a nickname in the Nicknames column to make it easier for users to find cameras and sources. For instance, one of the camera profiles in the figure has the nickname Cargo. To add or edit a nickname, select the camera or source on the list and click the Change Nickname button.

5. The Legend on the main window identifies the circles next to the profiles – green for streaming, yellow for ready to stream, orange with exclamation point for an error message. Camera profiles without a circle icon have been added as a source to the IP Streams software but have not been recognized by the Controller software.

6. When you are ready to stream an IP camera or RTSP source, select the profile on the IP Streams main window and click the Connect button to connect to the Controller. The Controller software needs to be running for the IP Streams software to connect to the Controller.

7. From the Controller, go into the Content List on the Control Panel and locate the IP Streams folder. The Content List has a permanent folder for IP Streams content. Go into the folder and click on the IP camera or IP source profile that you want to stream to the Radian Xt UHD or HD Viewer displays.

8. When an IP camera or RTSP stream is running, use the StreamMonitor window, showing up to the left of the main window, to check the status of the stream you have selected in the main window. The data tracked includes codec, resolution, and frames.
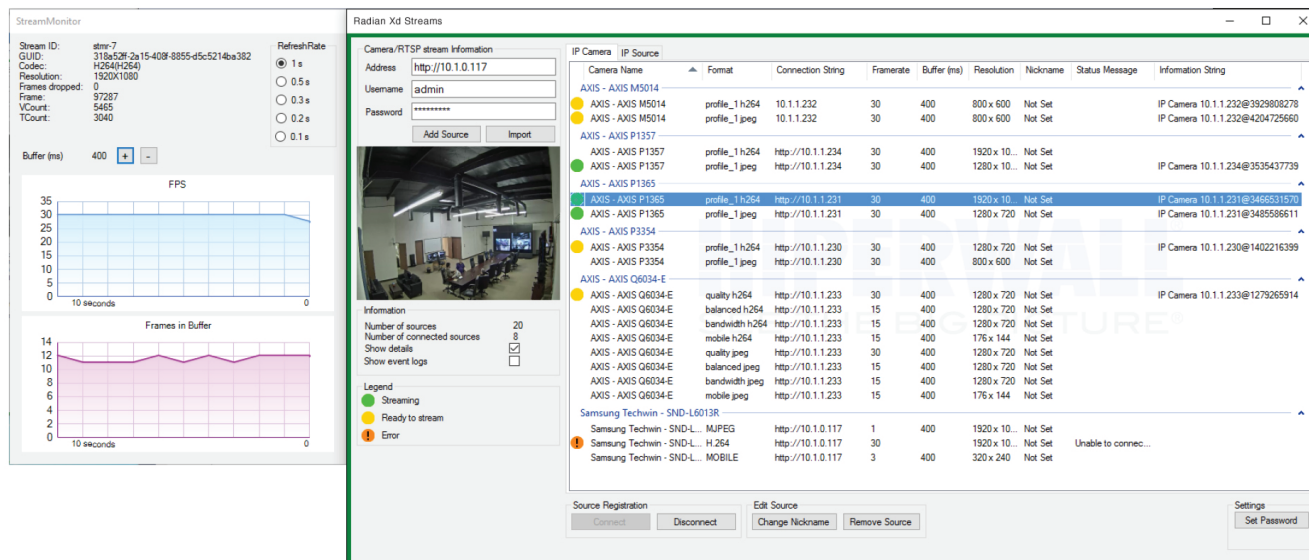
FIGURE 8-17. STREAM MONITOR

You can use the status window to adjust the refresh rate, from 0.1 seconds to 1 second, and click on the plus and minus (+, -) buttons to adjust the buffer size if needed.

Adjusting the buffer size to prevent buffer underrun will introduce video delay. Increasing the buffer increases the cache, which could make the stream more resilient to dropped packets. A bigger cache, however, adds delay to when the information shows up on the display wall.

9. If there is an error during the IP stream – for instance, a camera is not responding, or only half of an image is coming in or the image is frozen – click on the Show event logs check box. This will bring up the event log.

Review the event log for more information on the error or problem. For instance, the example of the event log, next, shows that the IP camera was not responding to the IP Stream request for connection at first but then connected.
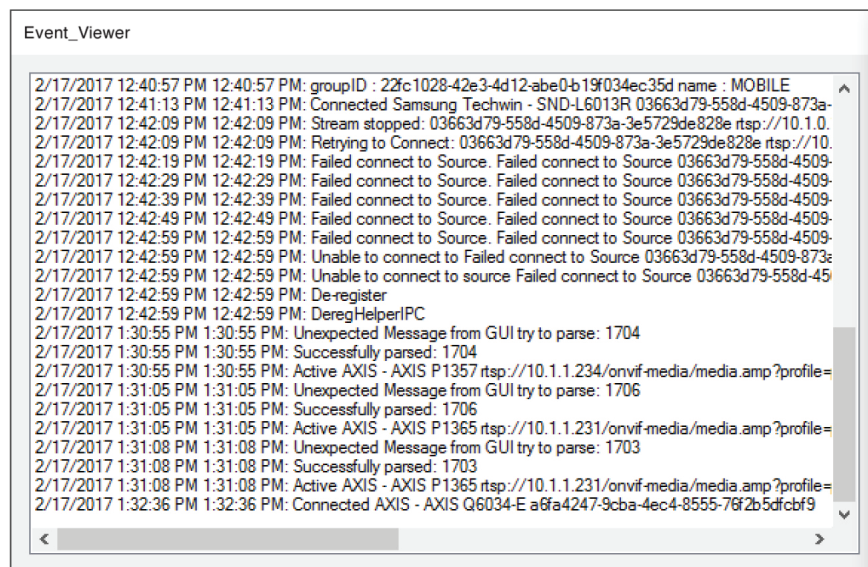
FIGURE 8-18. EVENT LOG

10. Set a password to save the camera or RTSP info for future use. Click the Set Password button on the IP Streams main window. This brings up a password prompt.
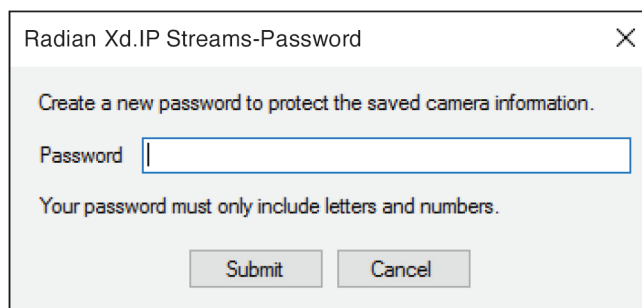
FIGURE 8-19. PASSWORD PROMPT

11. Access saved IP cameras and IP sources in the future by clicking on the profiles in the main window of the IP Streams software. In the Controller software, IP cameras and RTSP sources are saved for future use in the IP Streams folder in the Content List.

12. To remove an IP camera or IP source from the Controller, go to the IP Streams software and click the Disconnect button on the main window.

13. To delete an IP camera or IP source from the IP Streams software, go to the main window of the IP Streams software. Click on the IP camera or source and click on the Remove Source button. Profiles are part of the camera or source. Deleting a profile deletes all profiles from the camera or source and also deletes the camera or source.

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8.4 RADIAN XD SENDER SOFTWARE

Radian Xd Sender software allows you to show data from nearly any application, even proprietary ones, on the display wall. Sender software can run from anywhere in the world with a network connection, and when used with Radian Flex Cast —Source Remote Broadcasting software, can share live feeds with multiple Radian Flex Systems around the world.

Send a single application from the Sender computer or multiple applications. You can also have multiple Radian Xd Sender computers, each showing different content on the display wall. For instance, content from four Sender computers can come together on the wall so it looks like this:
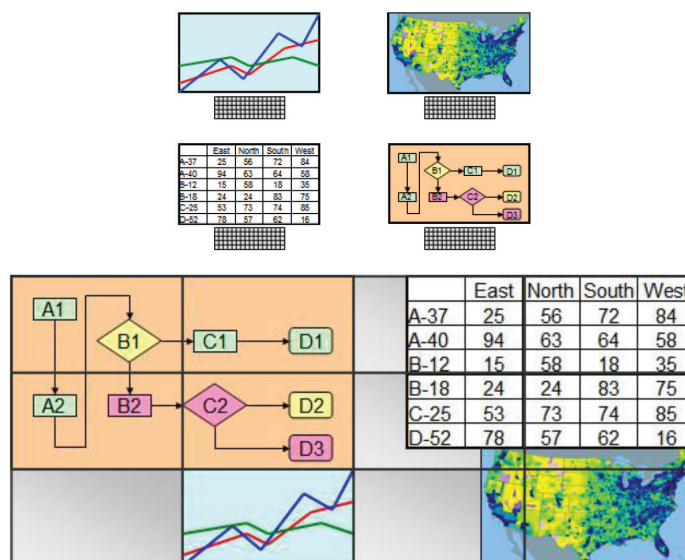
FIGURE 8-20. CONTENT ON WALL

The Sender software gives you the flexibility to deliver the entire screen to the wall or to divide it up into rectangular regions, delivering each region to the display wall as an independent object. Sender software can capture the screen of a Windows PC, Intel Mac OSX machine or Linux PC at the resolution of the Sender PC – or less if you choose a portion of the screen to send.

Radian Xd Sender uses the Sender PC's processor to compress and send the data while also being bandwidth efficient. Though the sending process is computationally expensive, it is so bandwidth efficient that a display wall can have many Sender computers in use and Sender computers can even connect via Wi-Fi or over the Internet, both via the built-in proxy mechanism, and have good performance.

Depending on the performance and screen resolution of the Sender PC, the Sender software can send frame rates from a few frames per second to more than 40 FPS. A Sender computer with a fast processor with more CPU cores can send at a higher frame rate than a slower computer can for a given screen size. Depending on your hardware and network performance, very fast Sender computers can send large screens faster than some Radian Xt UHD or HD Viewer computers can receive them. Avoid using lower-powered computers with low frame rates and significant lag before screen events show up on the display wall. Use the throttle slider adjustments discussed later in this chapter.

You can install the Radian Xd Sender software and Radian Xd Streamer software on the same computer, if needed, though with some performance penalty for each.

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CONFIGURING AND SELECTING THE SENDER SOFTWARE

Before you can select Sender content on the Control Panel, you should configure the Radian Xd Sender software.

1. Check that the Controller software is running on the Controller computer.

2. Start the Radian Xd Sender software on the Sender computer.

If the Sender computer is on the same subnet as the display wall, the Sender computer will connect automatically to the Controller computer using a cryptographically authenticated connection. The Sender software's proxy connections (described later) are both authenticated and encrypted.

3. The name of the Sender will show up in the Senders folder of the Content List on the Control Panel. Select it for display on the wall.

NOTE: It can be helpful to rename each Radian Xd Sender computer to help you quickly find it on the Control Panel. For example, the Sender computer showing the system status might be named SystemStatus. Sender windows can be renamed from within the Sender.

4. Clicking on the Radian Xd Sender software brings up the Sender, as shown below. Click the Main tab for three options: Advanced Settings, Pause Radian Xd, and Configure Source Windows.
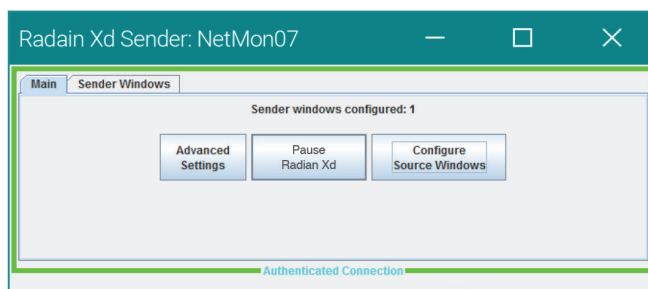

FIGURE 8-21. SENDER

5. Click the Configure Source Windows button to review the options, discussed next.

The Configure Source Windows button brings up resizable windows for each configured Sender window. Each Sender window sends the region covered by these resizable windows. The Sender software supports multiple Sender windows sent from a single machine.
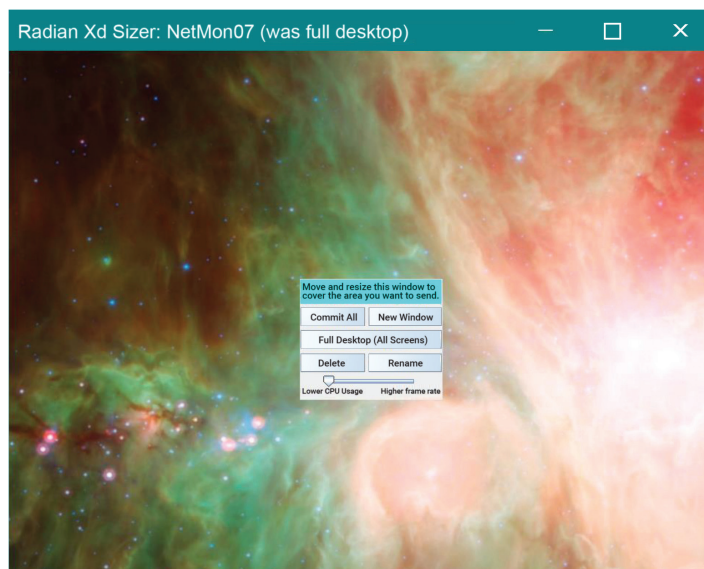

FIGURE 8-22. SIZER

- Click the New Window button to add a new Sender window. Remove a window by clicking the Delete button or the close box in the title bar. Removing all windows without committing changes simply restores the previously existing windows.

- Click the Commit All button to commit the Sender window positions and settings.

- The Full Desktop (All Screens) button commits a single Sender window that covers all screens on the Sender computer.

- Rename the Sender window with the Rename button and delete the Sender window with the Delete button.

- Each Sender window has individual performance slider settings. If needed, slide to increase the frame rate or decrease the CPU utilization. Moving the control to the left decreases the frame rate so more of the CPU cycles can be freed up for the application that is being sent. Experiment with the slider to find the best setting for your hardware and the content you are sending. Also see the Advanced Settings options discussed below.

- While the Sender windows are being configured, the Sender windows show gray on the display wall to protect the privacy of the screen contents during sizing operations.

- Keyboard shortcuts allow movement and sizing of the sizer window: the arrow keys move the window, while shift-arrow grows the window in that direction and ctrl-arrow shrinks the window in the direction of the arrow.

6. Click the Advanced Settings button and review the Streamer Behavior Settings and Advanced Network Settings.
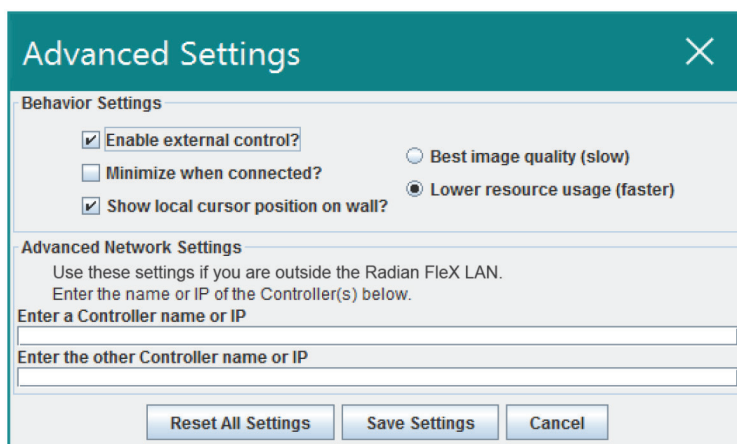
FIGURE 8-23. ADVANCED SETTINGS SCREEN

- The Sender software allows you to access the Sender from the Controller with Radian Xm, also known as KVM or keyboard-video-mouse. Check Enable external control to enable such access. Uncheck to disable external control.

- Minimize when Connected – The Sender window can automatically minimize/hide itself to the taskbar when a connection is established with the Controller.

- Show local cursor position on wall – Check this box to show a representation of the local Sender cursor on the Radian Xt UHD or HD Viewer displays.

- Select between Best image quality for more resource-intensive (higher CPU and network usage, substantially lower frame rate), but high quality data feed and Lower resource usage for faster frame rates while retaining good image quality. Also see the performance slider settings on the Sender window, discussed above.

- Review the Advanced Network Settings if the Radian Xd Streamer computer is outside the Radian Flex LAN. If the Sender and Controller computers are not on the same subnet, enter the IP address or fully qualified Internet domain name of the Controller (or a firewall protecting it). You will need to set intermediate firewalls to forward port 14999 to make remote proxy connections work.

- Note that the Advanced Settings panel shown above shows the Radian Flex Pro with fault tolerance – the Sender connects to two Controller computers in the same Radian Flex System. Even for the Radian Flex Pro, leave the Controller fields empty if the Sender is

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on the same LAN as the two Controller computers.

◆ When you are done reviewing the Advanced Settings panel, click Save Settings. The Reset All Settings button clears all settings for the Radian Xd Sender software, resetting it to the initial state.

7. Click the Pause Sender button to replace each Sender window's content on the wall with a gray rectangle. This allows the user to prepare the content to be displayed, check email, enter passwords, or other private activities that should not be displayed on the wall. Click Unpause to resume sending.

8. Click the Sender Windows tab to bring up the Sender Windows pane. This shows how many frames per second each Sender window is sending and how many are being dropped by the Radian Xt UHD or HD Viewer computers. The Multi-Sender window is resizable by dragging the edges to the entire status line can be viewed.
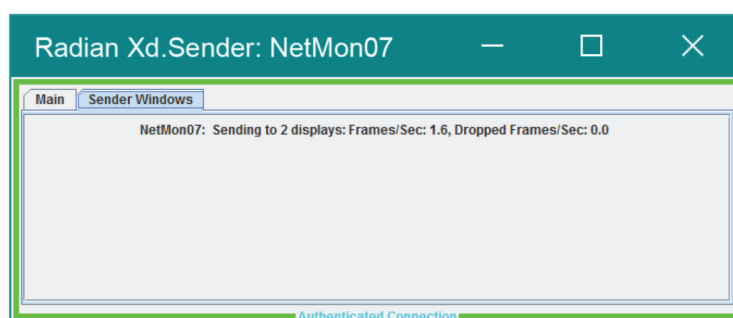
FIGURE 8-24. SENDER WINDOWS TAB

NOTE: Review the information on the Sender windows tab, above. Depending on the performance of your computer hardware and network, it is possible that the Sender computer may send screen updates faster than the Radian Xt UHD or HD Viewer computers can show them on the display wall. This is shown by the frame drop number. In most cases, move the speed slider in the Sender Windows panes to the left so the number of dropped frames approaches 0.

Also review the settings in the Advanced Settings window.

8.5 RADIAN FLEX CAST — SOURCE REMOTE BROADCASTING (USE WITH RADIAN XD SENDER)

Radian Flex Cast —Source Remote Broadcasting is a powerful communications and collaboration tool that allows Sender content to be shared among multiple walls, even in different facilities or around the world. Use the settings in Radian Flex Cast —Source Remote Broadcasting software to control what content can be distributed to which destinations. The next figure shows the Radian Flex Cast —Source Remote Broadcasting interface.

The Radian Flex Cast application requires a powerful machine with high-performance network connectivity and may not reside on the same computer as the Controller software. The Radian Flex Cast computer needs to be accessible by network to all the Radian Xd Sender machines you want to distribute to other walls. The Sender computers connect with the proxy, so if the Radian Flex Cast computer is behind a NAT router, port 14999 must be forwarded to the Radian Flex Cast computer.

To troubleshoot Radian Flex Cast connections, make sure Sender proxy connections work correctly before trying Radian Flex Cast connections. Once configured, Radian Flex Cast is intended for unattended operation other than making permissions changes.
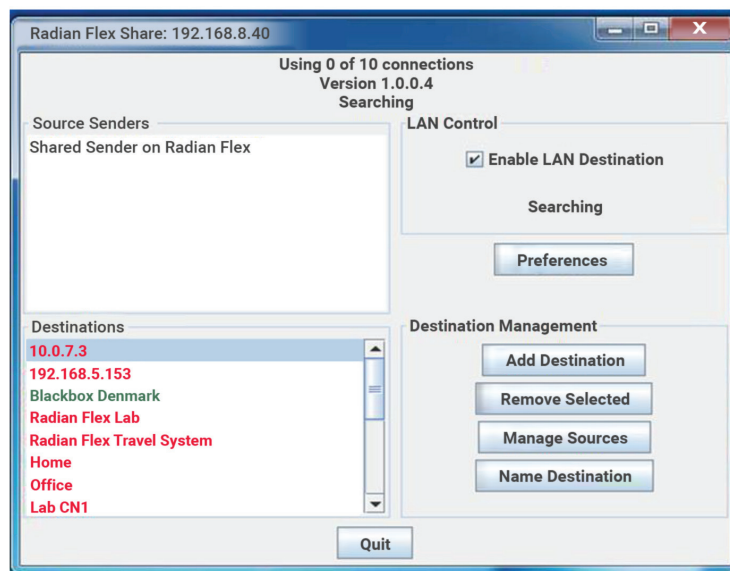
FIGURE 8-25. SHARE SCREEN

1. Source Senders and Destinations lists:

◆ The top left box lists all the connected source Senders, while the bottom left box shows the destinations currently defined. A green color means the destination is connected, while red means it is not currently available.

◆ Whenever a Radian Xd Sender connects to Radian Flex Cast software, it is immediately shown in the Source Senders box and it also becomes available in the Senders folder on allowed Destination Radian Flex Control software (more on permissions later).

◆ Each time a Destination Radian Flex opens such a Sender to show on the display wall, a connection license is used. When the number of purchased licenses is exhausted, error messages are shown on the screen upon new open attempts. When a shared Sender is closed, the license is returned to the pool for use by future connections.

2. LAN Control:

◆ The top-right box, Enable LAN Destination, allows the Radian Flex Cast software to send to a local Radian Flex via the LAN. This is only useful if the Radian Flex Cast computer is on the network.

◆ Radian Flex Cast has the capability to offload proxy work from the Controller software. Instead, Radian Flex Cast performs the proxy duties, typically resulting in slightly better performance and lower latency for incoming content from remote Sender machines.

4. Preferences button:

◆ The Preferences button opens the Global Preferences panel, shown next. You can set whether newly connected Senders are automatically visible to Destinations by default. This can also be changed on a per-Destination basis.
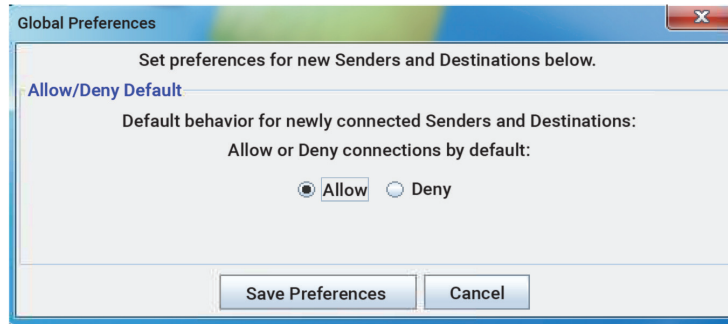
FIGURE 8-26. PREFERENCES

4. Destination Management:

◆ Add destinations with the Add Destination button. Just type an IP address or fully qualified domain name into the box that appears and Radian Flex Cast software will try to connect to the Radian Flex Controller at that destination.

◆ Use the Remove Selected button to delete a Destination from the list.

◆ Use the Manage Sources button to control which Radian Xd Sender sources are allowed to be forwarded to the selected Destination.

◆ Use the Name Destination button for a more user-friendly name to be shown for a Destination rather than its IP address. A user-friendly name can help Radian Flex users quickly choose the correct destination.

◆ The Delete Selected Entries button allows unused entries to be deleted from the list.

5. Destination Connection Settings:

◆ The window shown below is an example of how permissions are defined. Each Radian Xd Sender machine known to the Radian Flex Cast software is listed, even ones not currently connected, along with whether each Sender is allowed to be forwarded to the specified Destination Radian Flex.
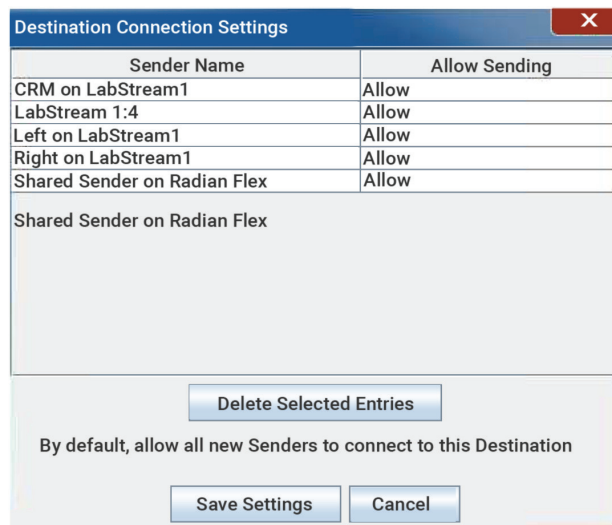
FIGURE 8-27. DEFINE PERMISSIONS

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◆ The checkbox shown in the previous screen allows specifying whether newly connected and previously unknown Senders are allowed to be forwarded to the Destination Radian Flex by default or not. These permission settings allow both fine-grain and medium-grain privacy and security management for a Destination Radian Flex, while the setting the Preferences pane supports coarse-grain management of all Destination Radian Flex units.

8.6 RADIAN XM KVM CONTROL

Because your Radian Xd Sender and Radian Xd Streamer computers could be in distant locations, rack mounted or otherwise inconvenient to access, Radian Flex offers the option of Radian Xm, also known as KVM (Keyboard- Video-Mouse). Radian Xm is for Sender or Streamer desktop capture only.

You can use Radian Xm to control a Sender or Streamer desktop capture computer from a Controller or a Radian Xc — ControlBridge Operator computer. You could use VNC instead (remember not to use Remote Desktop), but if Sender or Streamer desktop capture computers are outside of the Radian Flex LAN, VNC may cause security weaknesses. Radian Xm uses SSL encryption for all control messages from the Controller to the Sender and Streamer computers. In addition, all messages between Radian Xc — ControlBridge Operator computers and the Controllers also use SSL encryption, so Radian Xm messages are covered.

Note: This remote control (Radian Xm) mechanism sends keys, mouse movement and clicks to Senders and Streamers using Desktop Capture, and can only control portions of the desktop contained within the area being captured. Streams from capture devices and movies cannot be controlled via this mechanism.

To Control the Remote Radian Xd Sender or Streamer Desktop Capture Computer from the Controller:

1. Have the Sender or Streamer content displaying on the wall. If the content is not currently on the wall, go to the Control Panel and navigate to the Sender or Streamer computer that you want to control. Place the Sender or Streamer content object on the Control Screen wall area.

2. With the Sender or Streamer showing on the wall, double right click the Sender or Streamer content object. A green frame appears around the content object.

3. Now you can control the Sender or Streamer computer as though you were sitting in front of it. With the Radian Xm option, the Controller mouse and keyboard work on the Sender and Streamer desktop content as though you are using the mouse and keyboard physically attached to those computers.

4. When you are done, click another content object or click the background of the Control Screen.

FIGURE 8-28.

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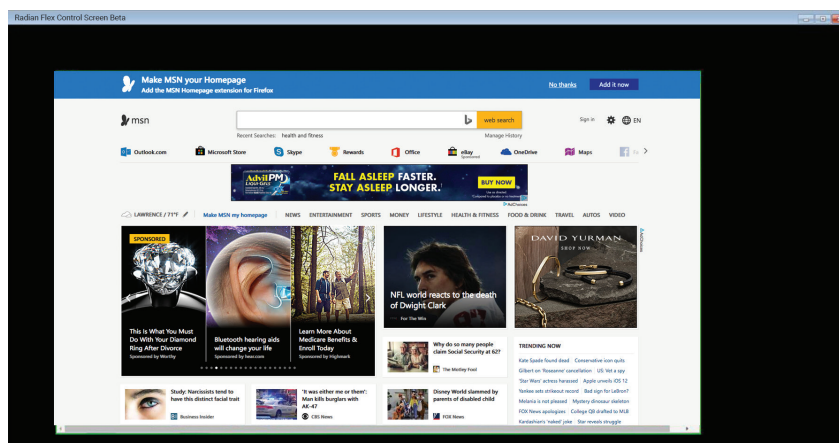
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To Control the Remote Radian Xd Sender or Radian Xd Streamer Desktop Capture Computer from Radian Xc — ControlBridge Operator:

1. To control any available Sender or Streamer (desktop capture only), select the object in the Contents List on the Control Panel, then choose the option to Control it.

- This opens a tab within the Radian Xc — ControlBridge Operator and allows Radian Xm operations on objects that are not displayed on the wall or are in slideshows, thus not individually selectable on the Radian Xc — ControlBridge Operator computer.

- In the tabbed pane, the object can be resized and scrolled, if it exceeds the windows size. Choose tabs to switch to other objects being controlled or the Radian Flex control tab to manage objects on the wall. Close a Radian Xm tab to stop the Radian Xm operation.

2. If a Sender or Streamer desktop capture is open on the wall and visible on the Radian Xc — ControlBridge Operator, right click the object and select the popup menu option to Radian Xm.

- Depending on the Radian Xm Zoom setting (see the Radian Xc — ControlBridge Operator section), the object being controlled may zoom to fill the Radian Xc — ControlBridge Operator window.

- A set of controls are overlaid on the desktop to allow panning and zooming the controlled object, as well as to send the Windows key and the Tab key (to support Alt-Tabbing). With Radian Xm content zoomed in, also use scrollbars to scroll the content.

Press the small "x" control or click outside the controlled object to stop the Radian Xm function and revert to normal mode.

9. ENVIRONMENTS, SLIDESHOWS, AND ANIMATIONS

Radian Flex software makes it easy to add functionality to any type of content, whether you are using stored images and video or live Radian Xd feeds. Select the content you want to show and use the Control Panel to add functionality to the way you want to show it. For instance, bring different types of content together to create an environment or slideshow, or add movement to images or text to create an animation.

Radian Flex Pro and Radian Flex Standard both offer streamlined ways to create environments, slideshows, and animations. Radian Flex software makes it as easy as clicking on a button or tab in the Control Panel and customizing the options to create the look you want.

Take your Radian Flex content in new directions – click on the buttons for Save Environment or Create Slideshow or click on the Animation tab and go from there.

9.1 RADIAN FLEX ENVIRONMENTS

Radian Flex Environments save the location and attributes of content objects on the video wall. Use environments to create a wall layout using any content—from stored images and video, to live Radian Xd feeds, to animation and slideshows—and then save that layout for future use, and even schedule the environment to run.

Radian Flex Environments save you time, as you do not need to recreate a wall display in the future. Use environments to prepare and stage combinations of content ahead of time so you can focus on the moment – presenting and interacting with the content on your video wall without having to take time to locate and arrange content objects. Prepare a series of Radian Flex Environments in advance to cover every anticipated situation and then select the environment when needed. You can also schedule environments to run.

There is no specific limit to the number of saved environments. You can show one or more environments on the video wall at the same time. Typically, users show one environment at a time, but you can also combine environments.

9.1.1 CREATE A RADIAN FLEX ENVIRONMENT

1. Start with a blank wall. In the Control Panel, clear the Radian Xt UHD or HD Viewer displays by clicking the Clear Display button.

2. In the Control Panel, select the content objects from the Content List and place them on the Control Screen. You can select any form of content, including slideshows, animations, and Radian Xd live feeds, to be part of the environment.

3. Make any changes to the size, transparency and so on to the content objects. For details about these settings, see Positioning and Sizing Content.

4. Adjust the layering to make sure that the environment looks like it was intended when it is reused. Click on the Layers tab on the Control Panel. For details see Creating and Managing Layers.

5. When the content objects are the way you want them, click the Save Environment button.

6. Name the environment and click OK. The environment appears in the Environment folder in the Content List in the Control Panel.

9.1.2 USE AN ENVIRONMENT

1. Open the Control Panel and navigate to the Environments folder.

2. Select the Environment you want to use and click Show Selected.

3. At the prompt, click Yes to clear the wall or No to overlay the Environment over any content currently being shown on the Radian Xt UHD or HD Viewer displays.

4. The selected Environment appears on the wall. If a content object in the Environment is not available, you are prompted with a warning.

9.2 SLIDESHOWS

Radian Flex Slideshows can include a mixture of content objects – stored content and just-in-time content. When you create a slideshow, you specify how long each content object appears on the wall and how the objects fit in the slideshow area. Slideshows can be modified and added to after creation, so it is easy to experiment with content in slideshows.

If the content objects are not the same size, the area around the smaller objects is shown as black on the wall, if you select to maintain aspect ratio.

Show multiple copies of the slideshow on the wall at the same time. There is no specific limit to the number of saved slideshows.

NOTE: A Slideshow cannot include another slideshow or an environment. However, an environment can include slideshows.

9.2.1 CREATE A SLIDESHOW

1. Start with a blank wall. In the Control Panel, clear the display by clicking the Clear Display button.

2. In the Control Panel, select one or more content items for the slideshow.

3. Click the Create Slideshow button. The Slideshow Editor menu appears.

4. Select objects for the slideshow. In the Control Panel, drag-and-drop content items from the Contents List into the list area of the slideshow editor window. Select and drag-and-drop to re-order objects in the slideshow content list.
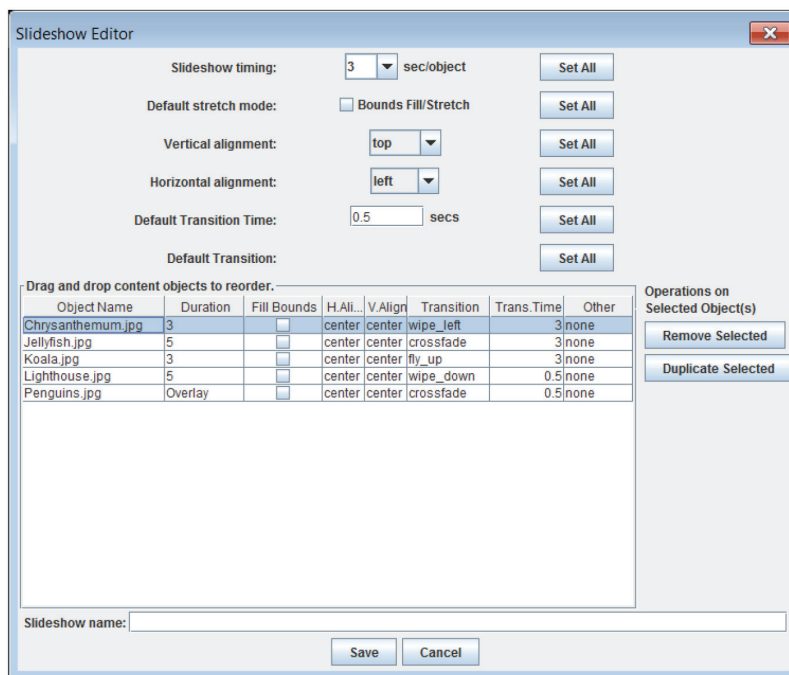
FIGURE 9-1. SLIDESHOW EDITOR SCREEN

5. Timing – Select the time period you want each content object to appear on the wall. Each object can have its own timing. Two special durations are "Overlay," which overlays the slideshow with any such objects, and "Background" which uses the specified object(s) as the slideshow's background.

6. Aspect ratio – Specify if content objects should use their original aspect ratio or should stretch to fit to the area by checking or unchecking the "Fill Bounds" check box. If you stretch to fit, the content objects will distort; for example, circles may not be round or people may become short and squat or tall and skinny. This can create interesting visual effects.

CHAPTER 9: ENVIRONMENTS, SLIDESHOWS, ANIMATIONS

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7. Alignment – You can specify the alignment of each object within the slideshow. Depending on the shape of the object and the shape of the slideshow, the objects will be aligned as specified, but they will always stretch to fill one dimension of the slideshow. An illustration of alignment settings follows:
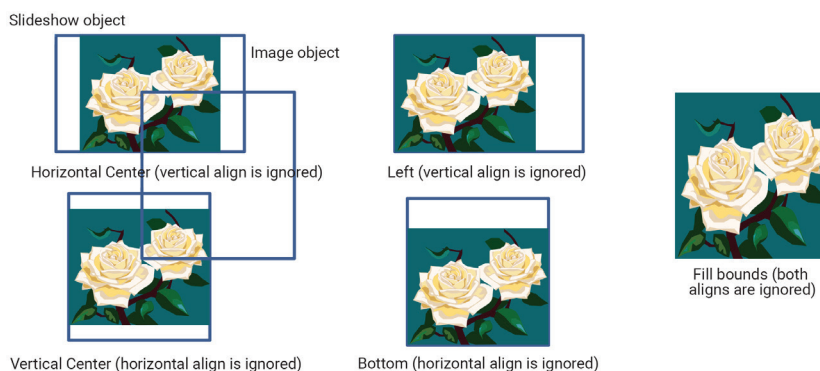
FIGURE 9-2. ALIGNMENT

8. Transition types – Radian Flex software offers several transition types for slideshows. The "transition" setting for an object specifies how it will be made visible (and hence, how the previous object will be removed). The "crossfade" transition fades the previous object out while fading the new one in. The "fly" transitions have the new object push the old object out in the specified direction. The "wipe" transitions replace the old object with the new one via a moving reveal-line that moves in the specified direction.

9. Overlay and background objects – Slideshows support designating one or more objects as "overlay" and "background" objects. These objects will be shown on top of or behind the current slideshow object, respectively. This capability can be used to frame slideshow content or add a logo. For best results, use PNG images with transparency for overlay objects. To set an object as an overlay or background object, choose "Overlay" or "Background" in the Duration column for that object in the slideshow editor.

10. Restart or continue playing – In the "Other" column, you can choose whether movies and streaming video restart when they appear or if they should continue playing from where they left off.

11. Sequence of objects – Adjust the sequence of slide show content objects. Objects may appear in a slideshow more than once. Use "Duplicate Selected" to duplicate an object. To re-order objects, select them, then drag-and-drop them into any order desired. Remove an object using the "Remove Selected" button. This only removes it from this slideshow, not the contents of the wall. Add additional objects by dragging them from the Control Panel content tree.

12. The five Set All buttons above the content list allow you to set the corresponding property of all the slideshow objects with a single click. This overrides any previously set values.

13. Specify a name for this slideshow.

14. When you are done, click Save. Your slideshow appears in the Content List in the Control Panel.

9.2.2 USING AND EDITING A SLIDESHOW

After you create and save a slideshow, access the slideshow in the Content List on the Control Panel. Place the slideshow on the wall as you would any other content object. Place multiple copies of the same slideshow on the wall or place different slideshows on the wall at that same time.

To edit a slideshow that you have already created and saved:

1. Select the slideshow in the Content List on the Control Panel.

2. The Create Slideshow button on the Control Panel changes to Edit Slideshow. Click on the Edit Slideshow button.

3. Use the controls on the Slideshow Editor window to edit the slideshow. Select new content on the Control Panel's Content List and drag new content over to the slideshow content list. Add or delete content or modify content features.

4. If needed, rename the slideshow with the Content Manager in the Control Panel not through this slideshow edit interface.

9.3 ANIMATION SEQUENCES

Radian Flex software makes it easy to create animations. Animation sequences are sets of key frames defined by the user. The Radian Flex software then interpolates between the key frames and moves or changes the specified object appropriately.

Animation key frames or steps are defined with a specific time difference from the previous key frame, and that time difference is the duration of the interpolated animation from the previous step to the current one.

You can apply animations to more than one content object, though a single object instance can only have a single animation controlling it.

To create or edit an animation:

1. Have the content on the Control Screen and select it by clicking on it. The boundary of the object will turn red and its name will show up in the top of the Control Panel on the Animation tab, as shown below.
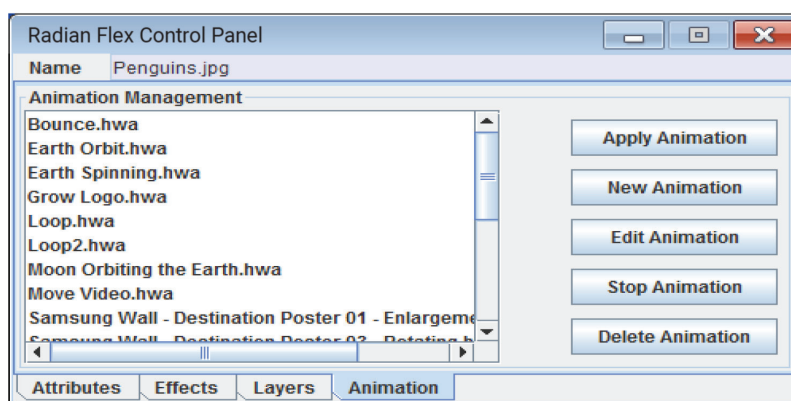

FIGURE 9-3. ANIMATION TAB

2. Click on the Animation tab on the Control Panel. To create a new Animation, press the New Animation button. To edit an existing Animation, click on an Animation name in the list and press the Edit Animation button. This opens the Animation Editor, shown next.

CHAPTER 9: ENVIRONMENTS, SLIDESHOWS, ANIMATIONS

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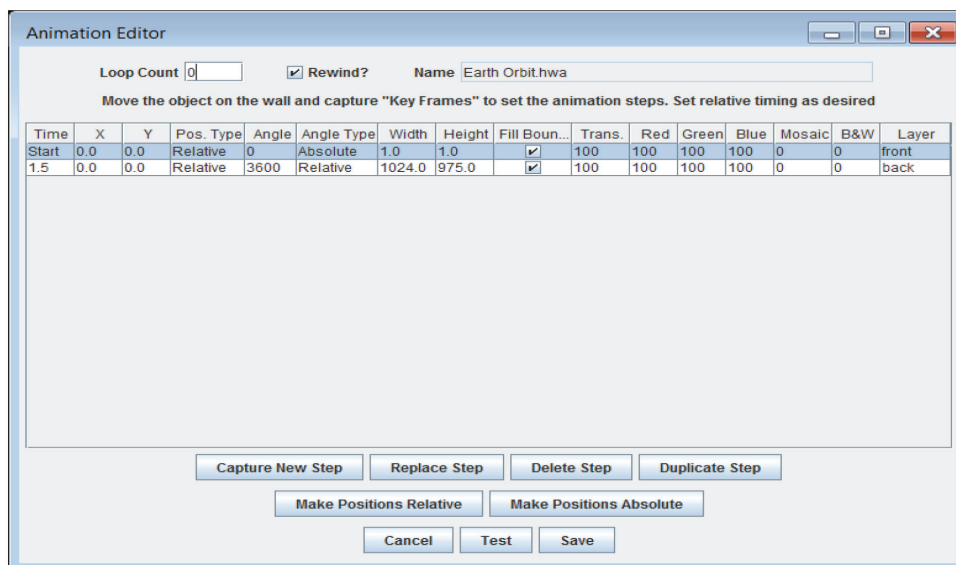
FIGURE 9-4. ANIMATION EDITOR

3. Each step in the Animation is a separate line in the Animation edit. Change the sequence of steps by dragging and dropping the steps on the list.

4. To define key frames or steps, move the object to the desired position and set all desired effects (rotation, transparency, etc.), then press the Capture New Step button. Repeat the process for each desired step.

5. Once a step has been captured, each of the values may be edited manually. Changing the time values changes the duration between steps (from the previous step to the current one).

6. The Make Positions Relative button and Make Positions Absolute buttons convert positions between relative and absolute values as long as they are unambiguous.

- If the Position Type is Relative, the movement values define the difference from the position of the previous step rather than an absolute position on the wall (all position values are in pixels).

- If the Angle Type is Relative, then the object will rotate that many degrees from the current angle in the specified time. For instance, 720 degrees is two revolutions counter-clockwise, and -720 degrees is two revolutions clockwise.

7. Layer changes happen at the start of the step rather than at some intermediate point.

8. The Replace Step button replaces the currently selected step with the current object state, while Duplicate Step duplicates the current step and adds it to the end of the list. This is an easy way to complete the animation by duplicating the first step so the animation returns to the initial state.

9. The Save button saves the animation, while Test runs through the animation once. The Loop Count value is the number of times the animation loops before finishing. A loop count of zero means repeat forever.

To apply an animation to a content object:

1. Select the object in the Control Screen so the border of the object is red, then choose the animation from the Animations tab in the Control Panel, and click Apply Animation. If an object being animated is selected, clicking Stop Animation will cancel the animation sequence.

2. To save animated objects in an environment, start the animations on the selected objects one at a time, then, while the animations are still running, click the Save Environment button.

When that environment is loaded, all the animations will start together and will remain synchronized while the environment is active. Slideshows within the environment are similarly synchronized, so their timing should match that of animations. Use environments to synchronize multiple animations.

CHAPTER 10: ADVANCED RADIAN FLEX CONTROL

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10. ADVANCED RADIAN FLEX CONTROL

Radian Flex software has several capabilities for advanced control of your video wall and distributed visualization system. This chapter brings together three key software components – Radian Xc — ControlBridge Operator, Radian Flex Scheduler, and Radian Flex Xs Services API Control License – designed to enhance your control of your Radian Flex System.

Use Radian Xc — ControlBridge Operator to control your video wall from anywhere—you can provide support and manage the look and feel of your wall from any location. Invite participants to interact with content using Radian Xc—ControlBridge Operator from their location.

Radian Xc — ControlBridge Operator's simplified controls provide basic control in an intuitive interface, a streamlined option for controlling your Radian Flex System.

Use the Radian Flex Scheduler to automatically show content on your Radian Flex System. Reach new audiences by changing and rotating content throughout the day and night. Or, have your Controllers and Radian Xt UHD or HD Viewer displays automatically ready to go for the times when people usually need use the video wall. Plan for every situation by setting up content and saving it as Radian Flex Environments, then when the need arises schedule the appropriate environment to automatically appear.

Use Radian Flex Xs Services API Control License, a web services-style interface, to control many functions of the Radian Flex System from external applications or devices, such as control systems, scripting languages, tablets, and smart phones. For instance, write a short program in XML, using commands provided by Radian Flex Xs Services API, to give one- touch operation of your Radian Flex System with a tablet control system, or trigger Radian Flex actions when events occur. Radian Flex Xs Services API is also known as the External Interface or API.

The advanced control capabilities discussed in this chapter can help save time in the daily operation of your Radian Flex System, making it possible to more effectively blend your Radian Flex video wall and distributed visualization system into the unique schedules and patterns of work in your organization.

10.1 RADIAN XC — CONTROLBRIDGE OPERATOR

Control your Radian Flex System from a remote computer with Radian Xc — ControlBridge Operator software. Radian Xc — ControlBridge Operator is an optional software component that works with the Controller software via a secure and authenticated connection to control the Radian Flex System from a computer that can be local or on the global Internet. Several computers running Radian Xc — ControlBridge Operator software may be used simultaneously.

Radian Xc — ControlBridge Operator allows you to open, close, and manipulate content with a simple and intuitive user interface. Other actions, including restarting the wall, are available if permission is given in the Controller settings.

The Radian Xc — ControlBridge Operator software consists of a single window that shows a representation of the Radian Flex displays and any contents being currently displayed, as shown below. Three menus allow basic operations that control the video wall and its contents or the Radian Xc — ControlBridge Operator's display.

1. The Actions menu includes actions that can clear the wall, put Radian Xt UHD or HD Viewer monitors to sleep, and more, as discussed below.

2. The Contents menu contains the list of contents available for display on the wall. Select an item from Contents to show it on the wall.

3. The Wall menu allows the user to focus on an individual wall, show all walls that are part of the system if there is a custom configuration, or show all open content objects, even if they are positioned off any wall. The view may change as objects are moved farther from or closer to walls.

NOTE: The Radian Xc — ControlBridge Operator software shows reduced resolution and slow frame- rate views of the objects on the wall. This is because Radian Xc software was built to support Wi-Fi and other low data rate connections. To conserve bandwidth, representations of stored video, movies, slideshows, and live feeds of Radian Xd content will only update roughly once per second on Radian Xc software.

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The following image shows some content on the Radian Xc — ControlBridge Operator software (and hence the Radian Xt UHD or HD Viewer displays) as well as the Actions menu. The available actions may change based on Controller settings whether to allow Radian Xc software and Radian Flex Xs Services API tools to perform system commands, like Restart and Shutdown. Radian Xc allows these actions on the display wall:

1. Clear All – clears the Radian Xt UHD or HD Viewer displays.

2. Settings – Activate a settings panel, described later.

3. Radian Xt UHD or HD Viewer Standby – Puts the Radian Xt UHD or HD Viewer computers with their monitors into a low-power Standby state.

4. Monitor Sleep – Puts the Radian Xt UHD or HD Viewer monitors to sleep but keeps the computer on.

5. Shutdown Display Wall – Shuts down the display wall, but keeps the Controller software and its computer running.

6. Restart Radian Flex – Restarts the Radian Xt UHD or HD Viewer computers and their software.

7. Wake Radian Flex – Awakens the Radian Xt UHD or HD Viewer computers after Shutdown, Sleep, or Standby.

8. Exit – Quits the Radian Xc software (does not affect the Radian Flex System).
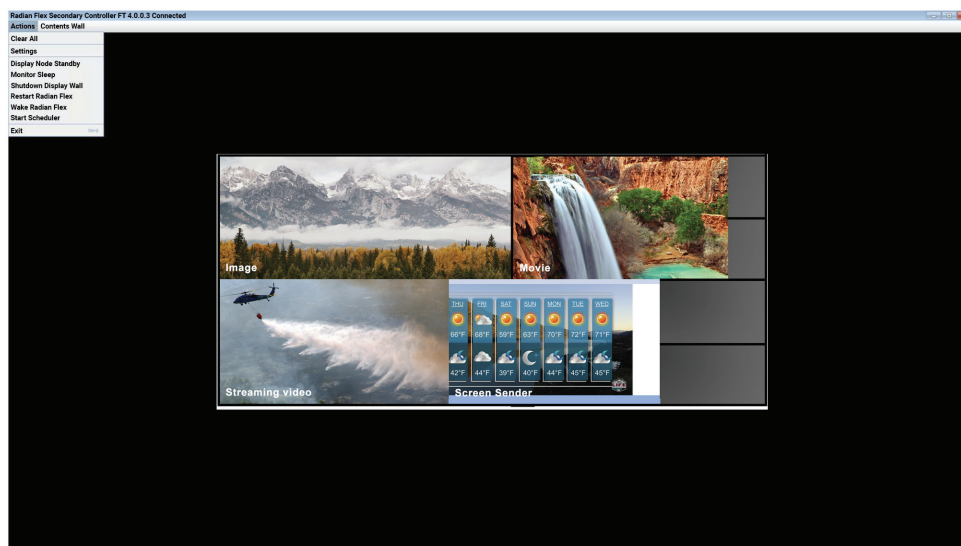
FIGURE 10-1.

The Radian Xc — ControlBridge Operator's Settings panel allows these settings and is shown in the following image.

1. The Menu Size checkbox makes the fonts used in the Radian Xc menus larger so they are easier to use on multi-touch screen computers (more below).

2. The box labeled "Remote Controller Addr:" is for the address or fully qualified domain name of the Radian Flex Controller computer if the Radian Xc computer is not on the Radian Flex LAN. An "Alternate Controller Addr:" field is available to support the fault tolerant Controllers of the Radian Flex Pro.

If the Radian Xc computer is on the Radian Flex LAN, it will automatically detect the Controller and connect. Otherwise, the Internet name or IP address of the Controller is needed. If the Controller is behind a NAT router, then the WAN IP address of the router goes in the box and the router must be set to forward port 15001 to the Controller computer's port 15001.

3. The Radian Xm Zoom option, if selected, causes controlled (Radian Xm) content objects to zoom to nearly fill the window so contents are more readable. Radian Xm, also known as KVM or Keyboard-Video-Mouse, uses keyboard and mouse actions to control Radian Xd computers. For more information on Radian Xm, see the Radian Xm section in Chapter 6.

4. The Clear button resets all settings to default, while the Commit button saves the settings, and the Cancel button leaves them unchanged.
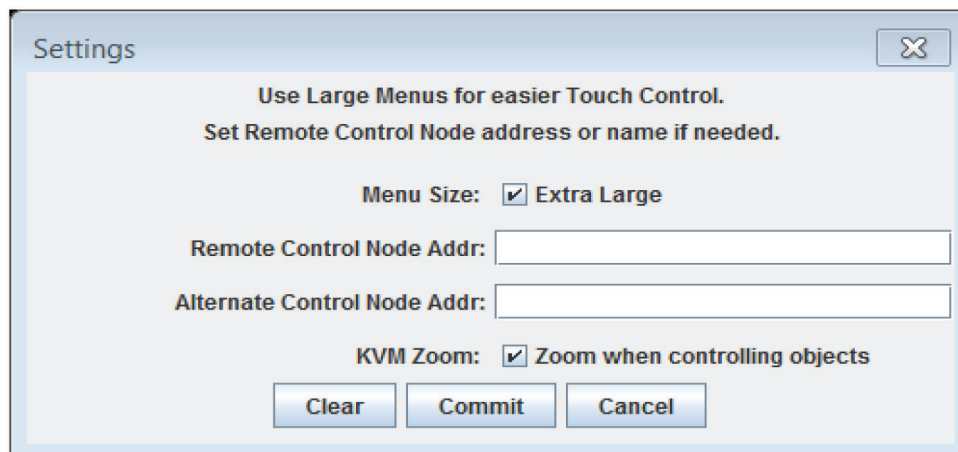
FIGURE 10-2. SETTINGS SCREEN

Because the Radian Xc software is a multi-platform Java application, it does not directly support multi-touch display systems, but as long as the multi-touch screen is fully supported by the Windows 7 multi-touch interface, the Radian Xc software works well with it. Two finger zoom is supported, because Windows interprets the action as mouse wheel movement, which the Radian Xc software supports for zoom. Rotation with two fingers is not supported.

The Radian Xc — ControlBridge Operator software supports keyboard actions like the Control Screen on the Controller. See the Keyboard and Mouse Commands table in Chapter 4 for the available commands and mouse actions.

10.2 RADIAN FLEX SCHEDULER

Using Radian Flex Scheduler to Schedule Environments and Actions:

Schedule environments and actions with the Radian Flex Scheduler. The Radian Flex Scheduler allows you to schedule content loading and initiate actions at set times on specified days. Open environments at specific times and automate when Radian Xt UHD or HD Viewer monitors/computers go to sleep or into standby mode or restart. The Radian Flex Scheduler offers many ways to manage and optimize your Radian Flex System.

To Schedule Content Loading Using the Schedule Manager:

1. Create and name the Radian Flex Environments you want automatically scheduled. See Chapter 7 for how to create environments.

2. Launch the Schedule Manager by clicking the "Schedules…" button on the Control Panel.

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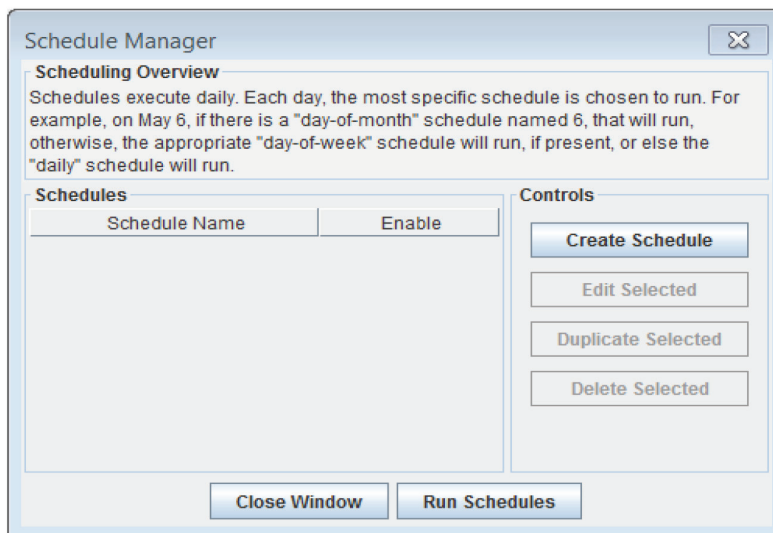
FIGURE 10-3. SCHEDULE MANAGER SCREEN

3. Create a new schedule with the "Create Schedule" button or edit an existing schedule by selecting it from the list and choosing "Edit Selected." Enable or disable schedules by checking or un-checking the "Enable" box next to each.

4. To create a new schedule, choose a scheduling period (Daily, Day-of-week or Day-of-month) and the appropriate day. The example below shows a schedule that will run each Saturday. Click "Set Schedule" to open the Schedule Editor.
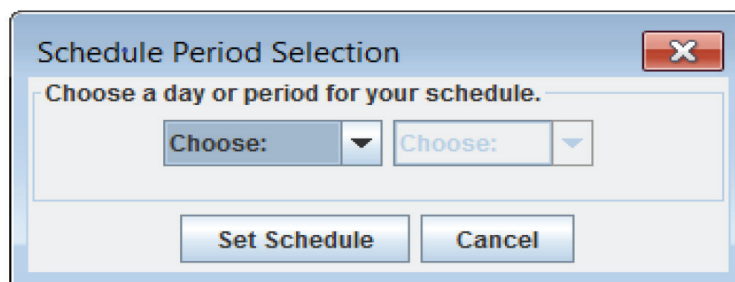
FIGURE 10-4. SCHEDULE PERIOD SELECTION SCREEN

NOTE: The Radian Flex software interprets schedules in order from the most specific to the least specific, so a particular day of the month will have priority over a day of the week, which has priority over daily schedules. For instance, make a default schedule to run daily, then for special events (recurring or not), add additional more specific schedules.

5. The Schedule Editor window shows all available Environments and various display wall actions in the "environments" folder.

Each environment can be added to the schedule to start at a specified time. Each environment replaces the previous one on the display wall at the specified time. The timing granularity for the scheduler is one second.

In the scheduler example below, the display wall monitors are put to sleep at midnight, followed by the Night environment content at 3:00 a.m. until 8:00 a.m., when the Night environment is replaced by the Day environment, which is in turn replaced at 8:00 p.m. by Night again.
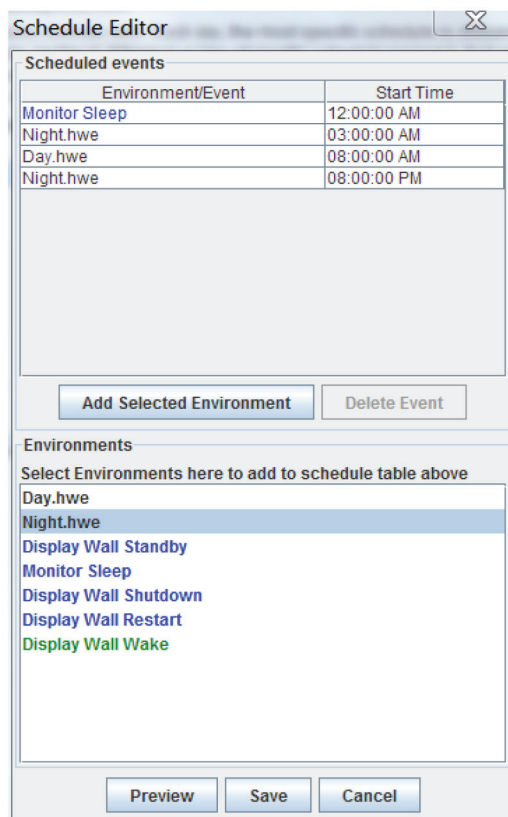
FIGURE 10-5. SCHEDULER EXAMPLE

6. Click the Add Selected Environment button to add an environment to the Scheduled events list.

7. The Delete Event button removes an environment from the list.

8. Changing an event's time in the Start Time column re-sorts the list according to start time.

9. Preview lets you quickly step through the environments on the display wall in timing order.

10. The Save button saves the schedule.

11. To duplicate a schedule, select it in the Schedules list and click the Duplicate Selected button. Give the new schedule a period and it will be created.

12. To run schedules, click the Run Schedules button. This will run the appropriate schedule and select the appropriate schedule each day for hands-off operation.

13. While the Schedule Status window is visible, access to the Control Panel is locked out. Click Cancel to resume normal operation. The Schedule Status window is shown next.
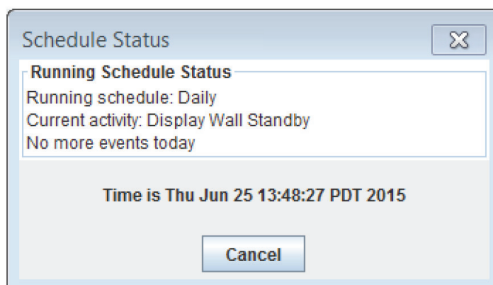
FIGURE 10-6. SCHEDULE STATUS SCREEN

10.3 RADIAN FLEX XS SERVICES API CONTROL LICENSE (EXTERNAL INTERFACE)

The Radian Flex Controller software provides a Web Services-style, HTTP- based external interface that allows external devices and programs to interact with and control the Radian Flex System.

Radian Flex Xs Services API Control License, the External Interface, provides mechanisms to list available content, navigate the content tree hierarchically, show and close content, and clear the screen. Opening a Radian Flex Environment via Radian Flex Xs Services API does not clear the Radian Xt UHD or HD Viewer displays.

Enable Radian Flex Xs Services API – click the checkbox and fill in the port on the Controller Preferences tab, reached via the Settings … button on the Control Panel. To experience Radian Flex Xs Services API, direct a web browser to port 8000 on the Controller computer. From the Controller computer itself, use http://localhost:8000/. See Chapter 8 for Radian Flex Xs Services API Control (External Interface) settings.

If Radian Flex Xa authentication is enabled for Radian Flex Xs Services API Control (see Radian Flex Xs Services API Control License Authentication with Radian Flex Xa for options), only the / xmlcommand options are valid, and all other URL-based operations are forbidden.

Radian Flex Xs Services API Control provides the following functionality simply by appending the specified string to the root URL.

TABLE 10-1. ACTIONS ON RADIAN XT DISPLAYS/COMPUTERS

PARAMETER	FUNCTION
/actions/restart	Reboot Radian Xt UHD or HD Viewer displays/computers
/actions/sleep	Sleep displays after a minute
/actions/standby	Standby Radian Xt UHD or HD Viewer displays/computers after a minute (i.e. sleep both Radian Xt UHD or HD Viewer displays and computers)
/actions/shutdown	Shutdown Radian Xt UHD or HD Viewer displays/computers
/actions/wake	Wake Radian Xt UHD or HD Viewer displays/computers from sleep, standby or shutdown

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TABLE 10-2. CONTENT MANAGEMENT

PARAMETER	FUNCTION
/list	Generate a list of all available objects (deprecated)
/open	Generate a list of currently open objects (deprecated)
/contents/<path to object>	Show the specified object on the wall (with or without optional parameters) (deprecated)
/close/<path to object>	Close the specified object on the wall (deprecated)
/clearall	Clear the wall
/xmllist	Return a list of available content with specifications. See Content Listing command.
/xmlwalls	Return wall specifications. See Wall Listing command.
/xmlcommand (POST)	Manage content. See Content Management command.

TABLE 10-3. OPTIONAL PARAMETERS FOR SHOWING AN OBJECT

PARAMETER	FUNCTION	DETAIL	USAGE EXAMPLE
&ar=a	Aspect ratio (%)	Variable Range: 0 < a Horizontally reduced: 0 < a < 1.0 Original ratio (default): 1.0 Horizontally stretched: 1.0 < a	/contents/startup.jpg&a r=1.5
&pos=x, y	Position (pixel)	Variable Range: Any x,y: center point of object. Default: 0,0	/contents/startup.jpg&p os=-500,500
&rgb=r,g,b	Color model (%)	Variable Range: 0 ≤ r,g,b ≤ 1.0 r: Red / g: Green / b: Blue Original color (default):1.0,1.0,1.0	/contents/startup.jpg&r gb=1.0,0.5,0
&rot=r	Rotation (*)	Variable Range: 0 ≤ r ≤ 1 -180°: r = 0 0° (default): r = 0.5 180°: r = 1	/contents/startup.jpg&r ot=0.75
&size=w,h	Dimension (pixel)	Variable Range: 0 < w,h w: Width h: Height Default: Original dimension	/contents/startup.jpg&s ize=1366,768
&trans=t	Transparency (%)	Variable Range: 0 ≤ t ≤ 1.0 Transparent: t = 0 Opaque (default): t = 1.0	/contents/startup.jpg&t rans=0.5
&zoom=z	Zoom (%)	Variable Range: 0 < z Original zoom (default): z = 1.0	/contents/startup.jpg&z oom=1.5

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10.3.1 CONTENT LISTING

The Radian Flex Xs Services API Control command /xmllist returns a list of the available content objects on the Radian Flex System in the following XML format:

```
<Objects>
        <Object type="Image">
                <name>big images/UCI.tif</name>
                <type>Image</type>
                <width>5000</width>
                <height>1667</height>
        </Object>
…
</Objects>
```

Each entry defines the type, both in the Object entry and as a separate type field. The type can be: Image, Sender, Streamer, IP Stream, Movie, Environment, Slideshow, or Unknown (though the latter should never occur). The name field contains the path within the contents directory. The width and height fields contain the size of the object, if known (some sizes are not known until the object is opened at least once).

If Radian Flex Xa authentication is enabled for Radian Flex Xs Services API Control, a /xmlcommand equivalent for /xmllist must be used. See the /xmlcommand documentation for details.

The /xmllist command can have optional parameters to filter the list. It can filter by type and by open/not open. The filter parameters are separated by the ampersand (&) character and include type= and open and notopen. These parameters are optional, and the type and open/not open filters can be used together or separately. As an example:

http://localhost:8000/xmllist&type=Movie&notopen

will return a list of the movie content objects that are not open. The types that can be filtered are: Image, Movie, Slideshow, Environment, Sender, Streamer, IPStream, Source (includes Sender, Streamer, and IPStreams), Text, and Animation.

NOTE: The IPStream filter has no space between IP and Stream.

The open filter also includes information about each open instance of each open content object. This includes a unique ID that can use used to manipulate that instance via the External Interface in the future, even if the object was not created via the External Interface. The format of the resulting XML is as follows:

```
<Objects>
        <Object type="Image">
                <name>"foo.tif"</name>
                <type>Image</type>
                <width>w</width>
                <height>h</height>
                <Instance>
                        <id>obj467</id>
                        <position>x,y</position> -- floating point values
                        <size>w,h</size> -- float pixel values. This is the
                                             -- actual displayed size on the wall
                        <rotation>rot</rotation> -- between -180 and 180 degrees
                        <transparency>trans</transparency> -- between 0 and 1.0
                        <rgb>1,0.5,1</rgb> -- each between 0 and 1.0
                        <bw>1.0</bw> -- between 0 and 1.0
                        <mosaic>1.0</mosaic> -- between 0 and 1.0
                </Instance>
                <Instance>
                        <id>obj94</id>
                        <position>x,y</position>
                        <size>w,h</size>
                        <rotation>rot</rotation>
                        <transparency>1.0</transparency>
                        <rgb>1.0,1.0,1.0</rgb>
                        <bw>1.0</bw>
                        <mosaic>1.0</mosaic>
                </Instance>
        </Object>
</Objects>
```

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10.3.2 WALL LISTING

The External Interface command /xmlwalls returns a listing of the defined walls and their dimensions. It has the form:

```
<Walls>
        <Wall>
                <name>Right Column</name>
                <left>0.0</left>
                <top>1140.0</top>
                <width>2010.0</width>
                <height>2280.0</height>
        </Wall>
...
</Walls>
```

Each Wall entry contains the name of the wall or "default" if the wall is not named in the configuration file. It also contains fields for the left and top positions (in pixels) and the width and height, also in pixels. It does not return a valid XML result if no Radian Xt UHD or HD Viewer displays/computers are connected.

An alternative method for getting the walls information is described in the /xmlcommand section.

10.3.3 CONTENT MANAGEMENT

The External Interface URL /xmlcommand is accessed via an HTTP POST operation that uploads an XML-encoded set of operations, as defined below. There are several operations supported:

- open shows an object on the wall and assigns it a user-specified ID
- close removes a specified object from the wall
- change modifies the parameters of a specified object (possibly over time, thus making an animation)
- list provides a list of objects in the same format as /xmllist
- environment saves the current content as a named Environment
- walls returns the wall configuration
- preview gets the thumbnail image for the specified object

Multiple such operations can be included in a single POST operation, though no dependencies are allowed between them, so an object cannot be opened and changed or closed in a single step.

When an operation succeeds, an HTTP result code of 200 (OK) is returned, while 403 (Forbidden) is returned upon error. Check the status pane in the Control Panel to see why the command failed. In all cases, the XML elements are case sensitive, so "Commands" is not the same as "commands."

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<Commands>
        <command type="type">
        ...
        </command>
...
</Commands>
```

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Again, the type field in the command statement above should be replaced with "open," "close," "change," or the other operations, as shown below.

10.3.4 OPEN COMMAND

The open command defines the initial position and properties for an object to be shown on the wall. It also defines the unique ID of the object that will be used by all other xmlcommand operations to manipulate the object.

The only required fields in the open command are the object path (name) and the ID to be used. Other fields are optional, including the size, position, and other properties. If they are not specified, the properties from the last time the object was closed will be used. The parameter fields that can be used in the open command are defined in "Parameter Fields for Open and Change Commands." The format of the open command is:

```
<command type="open">
        <name>images/earth.jpg</name>
        <id>my_image_1</id>
        …
</command>
```

10.3.5 CHANGE COMMAND

The change command changes the position and properties for an object already open on the Radian Flex. The only required field in the change command is the ID of the object to be changed. Other fields are optional, including the size, position and other properties. If they are not specified, the properties are assumed not to change. The parameter fields that can be used in the change command are defined in "Parameter Fields for Open and Change Commands."

1. One additional optional field is the queue parameter, which specifies whether the change operation should happen immediately (<queue>0</queue>) or after the previous change command, if any, is complete (<queue>1</queue>). The default is that change commands will be queued.

2. Another optional parameter is time, which specifies the time (in seconds, with minimum being 0.1) that the change operation will take from the current set of object properties to the set of properties specified in the change command.

Together, these optional parameters allow a sequence of change commands forming an animation to be sent without regard for the timing of the sending of the commands. Therefore, all the change commands for a long animation can be sent one after another (in separate POST operations – remember, no dependencies in a single xmlcommand POST operation), while the Radian Flex System will perform the animation over the time specified for each step.

The format of the change command is:

```
<command type="change">
        <id>my_image_1</id>
        …
</command>
```

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10.3.6 CLOSE COMMAND

The close command closes an object that is open on the wall. No further operations on that object are permitted. The close command cancels any queued animations and immediately closes the object. The format of the close command is:

```
<command type="close">
        <id>my_image_1</id>
</command>
```

10.3.7 PREVIEW COMMAND

The preview command requests the thumbnail/preview image for the specified object. On success, the image is returned as a JPEG or PNG image, depending on the object type, and the HTTP response code of 200 (OK) is used. The resulting image type is specified in the HTTP header "Content-Type" field. If the preview image is not available or the object is not found, a response code of 403 (Forbidden) is returned.

Because of the limitations of HTTP, only a single preview request can be delivered per transaction (HTTP does not allow multiple image results in a single transaction). Therefore, each preview command should be on its own, rather than part of a larger command group. The preview images tend to be square images, so the user must use the size information provided by the xmllist operation to draw them with the proper aspect ratio. The format of the preview command is:

```
<command type="preview">
        <name>images/earth.jpg</name>
</command>
```

10.3.8 ENVIRONMENT COMMAND

The environment command saves the current content as a Radian Flex Environment with the name specified in the name field of the command, as shown in the example below:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<Commands>
                <action type="environment">
                <name>example environment name</name>
        </action>
</Commands>
```

10.3.9 WALLS COMMAND

The walls command gets the current wall list and properties, as described in the

/xmlwalls section above. The following example shows how to use it:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<Commands>
        <action type="walls">
        </action>
</Commands>
```

10.3.10 LIST COMMAND

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The list action gets a list of objects in the same format as the /xmllist operation described above. The command may include an optional filter with the same format as for /xmllist, but with options separated via a semicolon rather than an ampersand. For example, the following XML command gets the list of all Streamer objects that are not open on the wall.

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<Commands>
        <action type="list">
        <filter>type=Streamer;notopen</filter>
        </action>
</Commands>
```

10.3.11 PARAMETER FIELDS FOR OPEN AND CHANGE COMMANDS

The open and change commands can take one or more parameters as part of the command sequence. Each parameter field has the format:

<parameter>value

where "parameter" is the parameter name (listed in the table below) and value is the (usually numeric) value. As many parameters as needed to specify the state of the object can be included, though conflicting parameters (zoom and bounds parameters, for example) may produce unpredictable results. If a parameter is not specified, it is assumed not to have changed (change command) or the previous value from when the object was last closed will be used (open command). Parameters, like the commands, are case-sensitive.

TABLE 10-4. OPEN AND CHANGE PARAMETERS

PARAMETER	FUNCTION	DETAIL	USAGE EXAMPLE
x	The x position of the object	Float value in Radian Flex pixel coordinates.	<x>100</x>
y	The y position of the object	Float value in Radian Flex pixel coordinates.	<y>-200</y>
rx	Relative x position	Float value for x position relative to current x position. Not valid for open command.	<rx>25</rx>
ry	Relative y position	Float value for y position relative to current y position. Not valid for open command.	<ry>-16</ry>
zoom	Object zoom	Float value within zoom limits set in Control Panel.	<zoom>1.1</zoom>
trans	Transparency	Float between 0 (transparent) and 1 (opaque).	/c<trans>1.0</trans>
red	Red color filter	Float between 0 (color eliminated) to 1 (color normal).	<red>0.5</red>
green	Green color filter	Float between 0 (color eliminated) to 1 (color normal).	<green>0.9</green>
blue	Blue color filter	Float between 0 (color eliminated) to 1 (color normal).	<blue>0.3</blue>
mosaic	Mosaic filter	Float between 0 (normal) and 1 (large mosaic tiles)	<mosaic>0.45</mosaic>

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TABLE 10-4 (CONTINUED). OPEN AND CHANGE PARAMETERS

PARAMETER	FUNCTION	DETAIL	USAGE EXAMPLE
bw	Black & White filter	Float between 0 (normal color) and 1 (monochrome appearance)	<bw>1.0</bw>
rot	Absolute angle (rotation)	Float value (degrees) between -180 and 180.	<rot>-45</rot>
angle	Relative angle	Float value (degrees). Positive is counter-clockwise. Not valid for open command.	<angle>720</angle>
aspect	Aspect ratio	Float value > 0	<aspect>1.5</aspect>
layer	Layer (ordering) of object	front – move to front layer forward – move up 1 layer backward – move back 1 layer back – move to back layer Layer change takes effect immediately	<layer>front</layer> <layer>back</layer>
repeat	Repeat the current step a number of times	The number of times to repeat the step. Not valid for open command.	<repeat>9</repeat>
boundsw	Define the maximum width of the object	Float value > 0. The object will stretch to fill the most restrictive of the width or height values.	<boundsw>8192</boundsw>
boundsh	Define the maximum height of the object	Float value > 0. The object will stretch to fill the most restrictive of the width or height values.	<boundsh>1024</boundsh>
boundsfill	Fill bounds or maintain aspect ratio	Fill: 1 Don't fill: 0 Only applicable when bounds set.	<boundsfill>1</boundsfi ll>
animation	Start or stop an animation	Value is name of animation to apply to object or "STOP" to stop a current animation.	<animation>Spin Left.hwa</animation> <animation>STOP</animation>
position	Define position based on wall	Format: [wall:]L,T,R,B where wall is the optional wall name (no brackets in the command), and L,T are the left and top fractions, while R,B are the right and bottom fractions. Not valid for "open" command.	<position>conf rm:0.1,0.2,0.6,0.4</position> <position>0,0,1,1</posi tion>
queue	The command should queue or not. If queued, it will run after the previous one finishes.	0: don't queue 1: queue (default) Not valid for open command.	<queue>0</queue>
time	Time to make change	Float >= 0 Defines the time from the last step to the completion of this one. All values other than layer will be interpolated between the two steps if time > 0	<time>10.5</time> <time>0</time>

Note that the "position" command is not valid when used in an "open" command. A simple way to work around this is to send an "open" command for the object with transparency set to zero. Then issue a "change" command with the desired position settings and with transparency set to one (or whatever transparency you want to use).

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10.4 RADIAN FLEX XS SERVICES WITH RADIAN FLEX XA

Radian Flex Xs Services API Control License allows control of the Radian Flex System by external devices and programs via HTTP operations. Such a powerful capability must have an authentication mechanism available when Radian Flex Xa (see Chapter 10) is active, but not all client devices are capable of complex authentication approaches. In addition, passwords are never sent over the Radian Flex Xs Services API Control connection, because different techniques are used. There are three levels of authentication to Radian Flex Xs Services API Control License:

◆ None – No authentication is required and the old, deprecated non-XML interface is available.

◆ Token-based – Simple authentication for very simple client software and components. A token is used to authenticate the client. This approach provides little security, but it does provide detailed logging of the actions performed on behalf of the Radian Flex Xs Services API Control client.

◆ Crypto-based – This authentication approach uses a cryptographically-generated session key to authenticate a client. The session key can be set to expire after a period of time or after each transaction. If they session key isn't expired yet, it can be re-used to quickly authenticate future operations. The key expiry is used to reduce the effect of or eliminate replay attacks.

The choice of Radian Flex Xs Services API Control authentication is made in the Controller Preferences tab of the Settings window, as shown below. If the Crypto-based authentication is chosen, an expiry timeout must be selected. The choices range from after every transaction (Immediately) to one day.
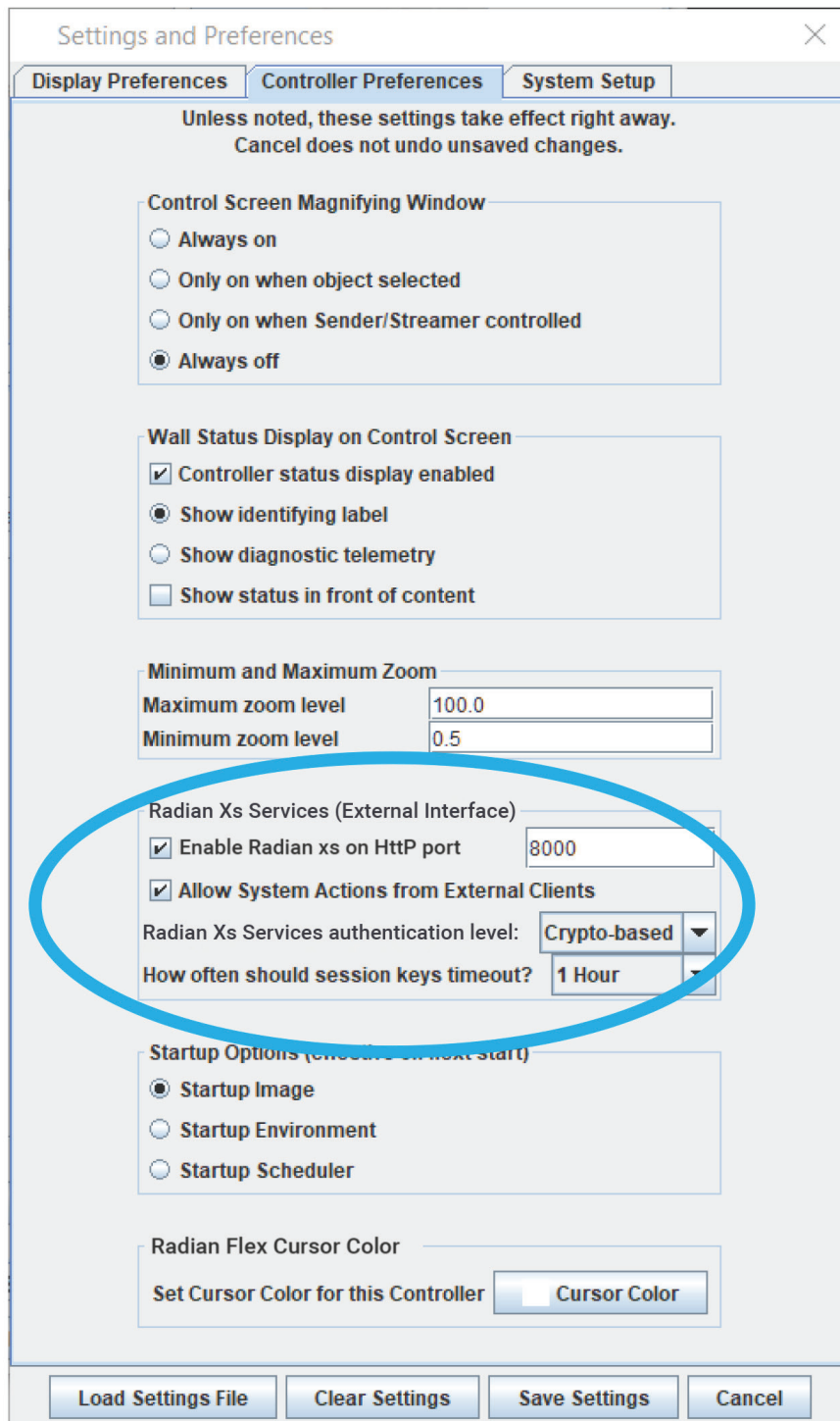
FIGURE 10-7.

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Radian Flex Xs Services API Control License authentication adds two new HTTP response codes when an operation is requested. These codes will only occur when the authentication level is not None.

◆ 403 Forbidden – If authentication fails or an operation is requested without authentication.

◆ 440 Login Timeout – If an expired session key is used.

The two authentication approaches, Token-based and Crypto-based, both require the addition of an authentication clause to XML-based Radian Flex Xs Services API Control License requests. The deprecated non-XML mechanism is disabled when authentication is enabled.

10.4.1 TOKEN-BASED AUTHENTICATION

This needs a very simple XML clause added to the request:

```
<auth type="token">
        <user>userid</user>
        <token>Hex String of simple shared token</token>
</auth>
```

The token string is the hexadecimal sequence shown in the New User or Edit User window after a Radian Flex Xs Services API Control License key is generated. That key can be selected and copied into a file or an email so the client software developers can use it in their program. The userid is the user name ("janedoe" in the Edit User example figure).

10.4.2 CRYPTO-BASED AUTHENTICATION

This approach uses the same key as the token-based approach, but never passes it as part of the requests. Instead, it is used to generate a session key that can be verified by the Control Panel, thus completing the authentication of the user requesting the operation. The initial authentication clause is as follows:

```
<auth type="crypto">
        <user>userid</user>
        <token>Hex string of generated session key</token>
        <nonce>Nonce string that results in the token as its signature(UTF-8).</nonce>
</auth>
```

Again, the userid is just the user name. Here, the nonce is a generated string, perhaps the time of day or other unique string. The nonce is not a secret, but should never repeat. The token in this case is a session key that is generated using the HMAC SHA1 message digest algorithm with the nonce as the message and the user's assigned key (again, the hex string from the user panel, but converted to bytes) as the key. This algorithm is cross-platform and language independent, so nearly any device with a crypto library can use this approach.

Example code in Java and Python can be provided upon request to Black Box Technical Support.

Once the session key is established and it hasn't expired yet, future requests can simply use the session key as the authentication XML clause, as shown below:

```
<auth type="session">
        <token>Hex string of generated session key</token>
</auth>
```

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If the session key has expired, the request will return the 440 response code, so the client program needs to generate a new session key using the previous clauses and re-send the request. The session key may be timed out early under the following circumstances:

◆ An administrator changed the Radian Flex Xa key for a user (this expires all session keys for all Radian Flex Xs Services API Control License users)

◆ An administrator chose to force-logout a Radian Flex Xs Services API Control License user

While expiring the session key immediately is the safest approach for security, since it prevents replay attacks, computing cryptographic message digest is expensive, and since it needs to happen on both the client system and the Radian Flex Controller, it can cause high resource utilization and delays. For that reason, longer expiry times are preferred. In no case can a session key last longer than a day, however, so Radian Flex Xs Services API Control License client programs must check for the 440 response code so they can re-authenticate and retry the request.

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11. CUSTOMIZING YOUR RADIAN FLEX

Radian Flex software has many options, preferences, and settings for customizing your Radian Flex experience. This chapter discusses three main areas of customization: Control Panel settings, Content Guidelines, and Radian Flex Tips and Techniques.

In the Control Panel section of this chapter, review and select the operation and performance settings available from the Settings … button; the tabs for Status, Messages, and Displays; and the Exit button, all located at the bottom of the Control Panel. These choices set your preferences for Radian Xt UHD or HD Viewer displays and Controllers and exiting your Radian Xt UHD or HD Viewer software.

The Control Panel section also guides you to run performance tests on your Radian Flex System and its network interface. Use the results of these tests to adjust your Radian Flex settings. The Black Box Technical Support Team can assist you with advice.

The next section of this chapter gives Radian Flex Content Guidelines – image formats and guidance for video and audio synchronization on the Radian Xt UHD or HD Viewer displays. The last part of this chapter is in Q&A format for resolving questions.

Radian Flex offers a Software Maintenance Agreement to help you get the most from your Radian Flex System and expedite support. The Black Box Technical Support Team is available to assist you in customizing the powerful capabilities of Radian Flex software for your content—contact us at 877-877-2269 or info@blackbox.com

11.1 CONTROL PANEL SETTINGS

The Control Panel is the access point for several menus that can help you tailor your Radian Flex experience to the unique needs of your organization. The Control Panel is part of the Controller software. The figure, below, shows the Control Panel with three key areas circled for customization – the Settings … button; the tabs for Status, Messages, and Displays; and the Exit button. All three are located at the bottom of the Control Panel.
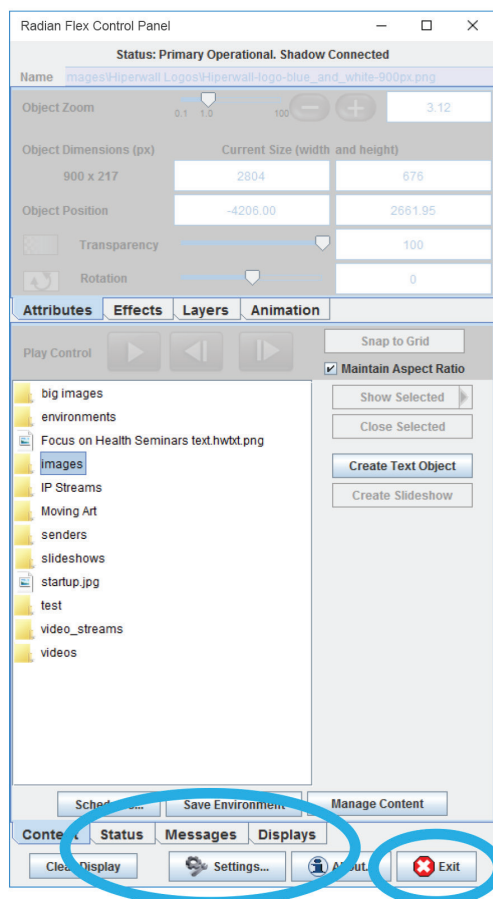

FIGURE 11-1. RADIAN FLEX CONTROL PANEL

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11.1.1 SETTINGS… BUTTON

Click the Settings … button at the bottom of the Control Panel to access the Settings and Preferences window, a central point for customizing your Radian Flex System. The Settings … button takes you to options for:

- Buttons along the bottom of the window for loading settings files and clearing, saving, and canceling settings.
- Display Preferences tab
- Controller Preferences tab
- System Setup tab

11.1.2 BUTTONS FOR LOADING, CLEARING, SAVING, AND CANCELING SETTINGS

Review the four buttons along the bottom of the Settings and Preferences window:
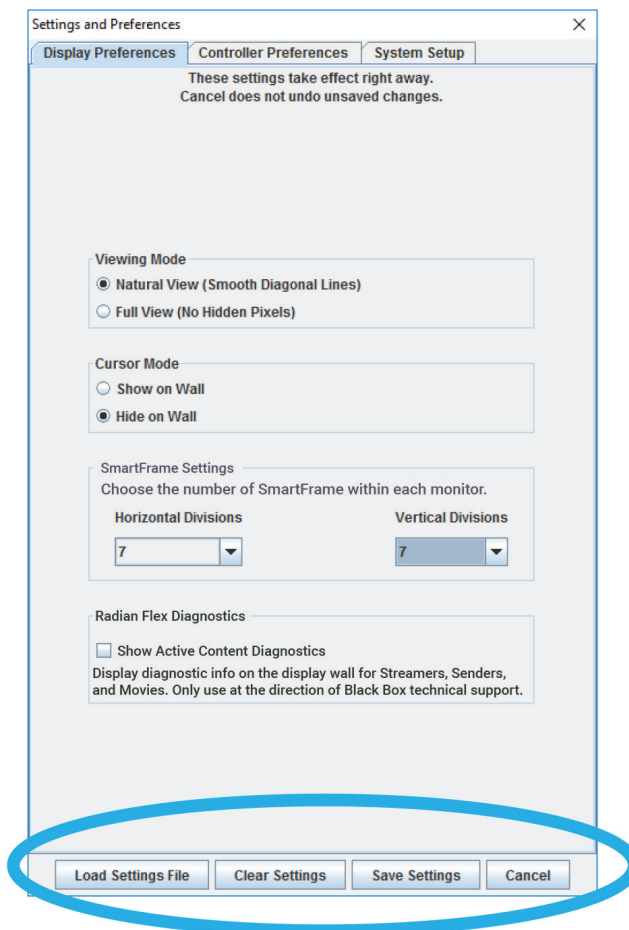
FIGURE 11-2. BUTTONS

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1. The Load Settings File button allows you to load a settings file, perhaps from a different machine, or to experiment with settings while supporting simple recovery.

2. Use the Clear Settings button to clear all settings.

3. Save the specified settings with the Save Settings button. This creates a backup file of the settings in the same directory as the contents directory.

4. The Cancel button cancels permanent settings changes.

These four buttons are always available from the three tabs at the top of the window.

11.1.3 DISPLAY PREFERENCES TAB

After clicking on the Settings … button, in the Settings and Preferences window, click on the Display Preferences tab for the Display Preferences panel. This panel controls preferences for the Radian Xt UHD or HD Viewer displays and their computers.

Changes made in the Displays tab settings take effect immediately and remain in effect even if the user cancels out of the Settings window. If the settings are saved with the Save Settings button, they will be used next time the Radian Flex System is started.

Review and make selections for these display preferences:

FIGURE 11-3. DISPLAY PREFERENCES

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1. Radian Flex software offers flexibility in how your content adjusts to the bezels in the monitors. From the Display Preferences tab, look at the Viewing Mode choices and select Natural View or Full View.

In Natural View, some content will appear "under" the bezels but the content looks smooth when you look from one from Display Node to the next. In this case, the human eye "fills in" the missing content, as it does when looking through a paned window. Natural view is usually best for images, movies and Radian Xd content.

In Full View, none of your content appears under the bezels but this creates "jumps" in the content where edges may not match exactly as you look from one Radian Xt UHD or HD Viewer display to the next. Full view is appropriate for content objects that need all data visible on the wall.

2. For Cursor Mode, choose whether the selection cursor shows up on the wall or not. The cursor is always displayed on the Control Screen.

3. SmartFrame allows you to snap objects to a grid that you select. Scroll the number wheels to select up to eight SmartFrame regions within each monitor. Or, keep it simple by specifying 0 regions to snap to monitor bezel boundaries. If set to more than one, the divisions will be visible on the Control Screen.

4. The checkbox for Radian Xt UHD or HD Viewer Diagnostics allows diagnostics for active content, such as Radian Xd content and movies, to be shown on the Radian Xt UHD or HD Viewer displays. These diagnostics will be visible on the display wall, so this should only be enabled when solving a problem in conjunction with the Black Box Technical Support team.

5. Zoom Levels: You can adjust zoom levels to fit the size of your wall and the size of your content. For very large or small walls or content, the default zoom levels may need to be adjusted. The "Minimum and Maximum Zoom" setting allows objects to be zoomed larger or smaller.

6. Select the color of the cursor in the Controller's Control Screen and on the display wall. In the Radian Flex Pro, the two Controllers can have different cursor colors so their cursors can be distinguished on the display wall.

11.1.4 CONTROLLER PREFERENCES TAB

Click on the Controller Preferences tab for the Controller Preferences. Changes to the Controller preferences take effect immediately and remain in effect even if the user cancels out of the Settings window. If the settings are saved with the Save Settings button, they will be used next time the Radian Flex System is started.

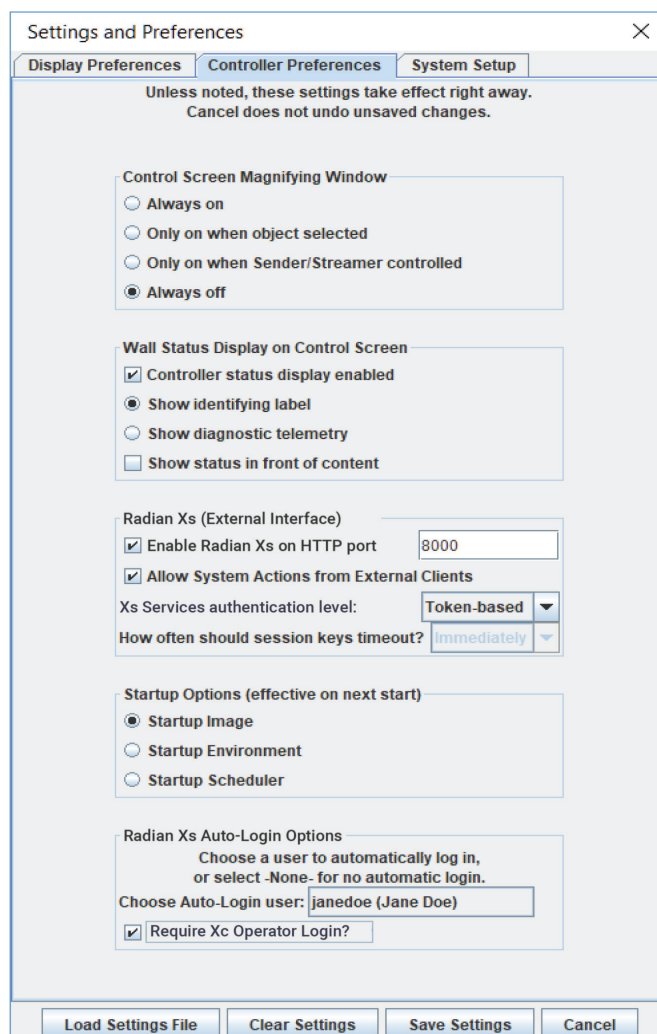Review and make selections for these Controller preferences:

FIGURE 11-4. CONTROLLER PREFERENCES

1. Control Screen Magnifying Window: The Controller software provides a magnifying window to help you see objects under the cursor on the Control Screen more clearly.

Select whether you want the magnifying window to be always on, only on when a Radian Xd computer is selected, only on when a Radian Xd computer is being controlled through the Control Screen, or off.

The magnifying window is particularly helpful for Radian Xd computers being controlled so the user can easily find and click buttons and links that would usually appear quite small on the Control Screen.

2. Wall Status Display: The Control Screen shows a gray tile for each Radian Xt UHD or HD Viewer display/computer. Check "Controller status display enabled" to add additional information to each tile.

Choose from showing the display name ("Identifying label"), network information ("diagnostic telemetry"), a nd "Show status in front of content" so the status is not obscured.

The wall status information is particularly valuable to determine the Radian Xt UHD or HD Viewer resource utilization of particular content items, such as movies and Radian Xd content.

3. Radian Flex Xs Services API Control License (External Interface): This area of the Controller Preferences tab enables or disables Radian Flex Xs Services API Control License, also known as the External Interface or API.

The Controller software provides a very simple web-based interface to allow remote users to display and close content on the display wall. The interface is also intended for use by remote control systems. Click on the checkbox for "Enable External Interface" and provide the HTTP port.

In addition, external controls, like the web-based interface and the Radian Xc — ControlBridge Operator software, can be allowed or forbidden to perform System Actions, such as restarting or sleeping the display wall. Check the "Allow System Actions from External Controllers" for this feature.

If Radian Flex Xa is enabled, Radian Flex Xs Services API Control License authentication can be enabled and the type of authentication can be chosen. See Radian Flex Xs Services API Control License Authentication with Radian Flex Xa. For more about Radian Flex Xs Services API Control License, see the Radian Flex Xs Services API Control License section in Chapter 8.

4. Review the Startup Options to determine what is loaded when the Controller starts.

Select the Startup Image option to show the Radian Flex logo on the wall at system start.

The Startup Environment option loads an environment named "startup.hwe" at startup. If "startup.hwe" does not exist, the startup image will be used instead. To create a blank wall at system start, put a black or transparent object in an environment named "startup.hwe." See Chapter 7, Bringing Content to Life for more information on creating Radian Flex Environments.

Select the Startup Scheduler option to run the appropriate schedule when the Controller is started, if there is any for the current time and day. See Chapter 8, the section on the Radian Flex Scheduler for more information on creating schedules to automatically display your content.

5. Radian Flex Xa options – Please see Chapter 10 for information on these settings.

11.1.5 SYSTEM SETUP TAB

On the Settings and Preferences Menu, click the System Setup tab.

Most of the settings in the System Setup window are for installing, updating, and testing the performance of your Radian Flex System – consult the Black Box Technical Support team for advice and recommendations for these processes, 877-877-2269 or info@blackbox.com In addition, the System Setup panel has a setting for the Controller window.

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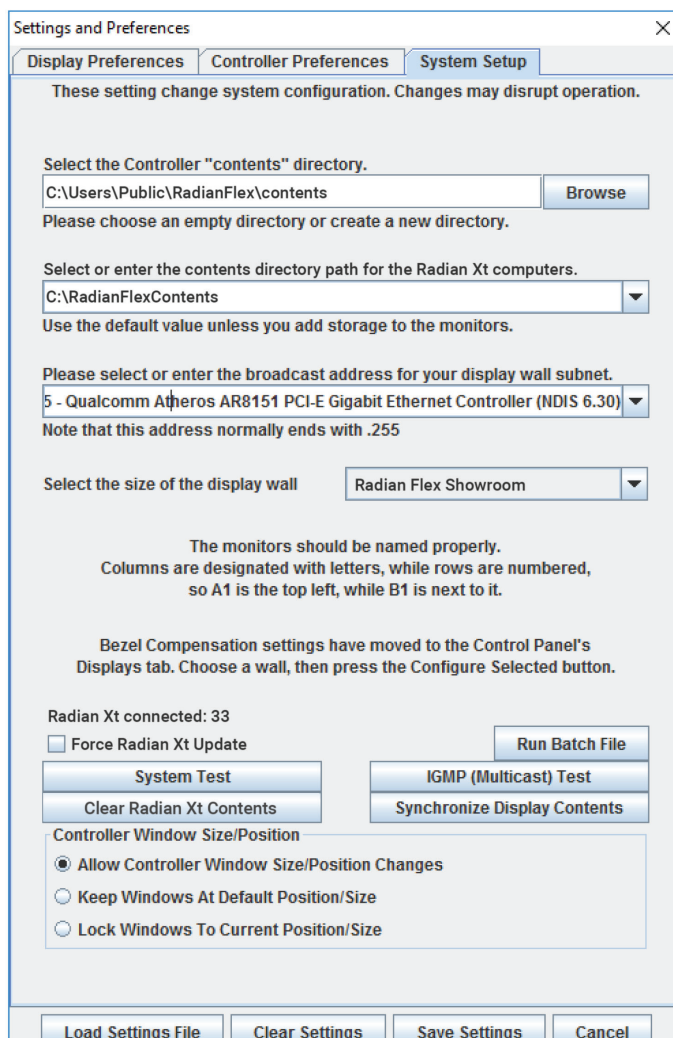**TECHNICAL**
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FIGURE 11-5. SYSTEM SETUP TAB

1. Specify the paths for the contents directory for the Controller computer(s) and Radian Xt UHD or HD Viewer computers, and the display wall subnet. On Radian Xt UHD or HD Viewer computers, successfully use the contents directory for stored content before you install or update Radian Xt UHD or HD Viewer software. See Chapter 3 for Installing Radian Xt UHD or HD Viewer Software, and Chapter 3 for more about updating Radian Flex software.

2. Select the size of the display wall, or, for custom configurations created with Layout Control, specify the arrangement. See Chapter 3 for more about naming display walls.

3. The System Setup tab shows the number of Radian Xt UHD or HD Viewer displays the Controller is controlling. Before updating Radian Flex software, check that your entire wall count is present. If not, wait a few minutes and verify that all the Radian Xt UHD or HD Viewer displays/computers reconnect before updating Radian Flex software. See Chapter 3 for more about updating Radian Flex software.

4. Make sure that the "Force Radian Xt Update" box is not checked unless directed by the Black BoxTechnical Support team during a support call. The checkbox is usually not needed. Any outdated Radian Xt UHD or HD Viewer computers will automatically receive update installers when the Controller software is updated.

5. Click the "Run Batch File" button to download and run a batch file on the Radian Xt UHD or HD Viewer computers. This button is needed for some monitors with embedded PCs to run an EWF script to commit changes to flash storage.

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6. The "System Test" button initiates a simple network test between the Controller and all Radian Xt UHD or HD Viewer computers. Failures and particularly slow (<10 MB/sec) connections may reveal bad cables, network ports, old drivers, etc. When the System Test is complete, the status log and a Network Test Results window automatically open to show the results. For more information on the status log, see Checking and Saving Status Messages (Messages Tab) in this chapter.

7. Because proper functioning of multicast networking is important for Radian Flex Systems, the IGMP Multicast Test shows whether multicast is working correctly. The IGMP Multicast Test requires a Radian Xd Streamer computer configured on the network (not on the Controller) as well as the Controller and at least two Radian Xt UHD or HD Viewer displays/computers. See Chapter 3 for how to run the IGMP Multicast Test and instructions for contacting the Black Box Technical Support team to review test results and make any adjustments.

8. The "Clear Radian Xt UHD or HD Viewer Contents" button removes contents stored on all Radian Xt UHD or HD Viewer computers. Use this feature to reclaim space before you change content location.

9. The "Synchronize Display Contents" button pushes all static content (images and movies) to Radian Xt UHD or HD Viewer computers. Use if you have replaced a Radian Xt UHD or HD Viewer System or if a Radian Xt UHD or HD Viewer display/computer was offline during content import time. Synchronizing the display contents may take a long time if you have replaced a Radian Xt UHD or HD Viewer system.

For the Radian Flex Pro, the Synchronize Display Contents button also synchronizes the contents of Controllers if a Controller was offline during content import time, in addition to synchronizing the contents of Radian Xt UHD or HD Viewer displays. The Radian Flex Pro has two Controllers for fault tolerance. For more about fault tolerant operations with two Controllers, see Chapter 5.

10. Select from three options to set the size and position of the Controller window(s).

11.1.6 CHECKING SYSTEM STATUS (STATUS TAB)

Click the Status tab, located near the bottom of the Control Panel, to see the current status of the Radian Flex System. The status information includes the number of Radian Xt UHD or HD Viewer displays connected and how many are running HD or UHD software; How many Radian Xd and Radian Xc — ControlBridge Operator connections are in use; The number of objects being shown on the display wall, and which Radian Xd and Radian Xt UHD or HD Viewer display last disconnected and when, if any. See the next figure.
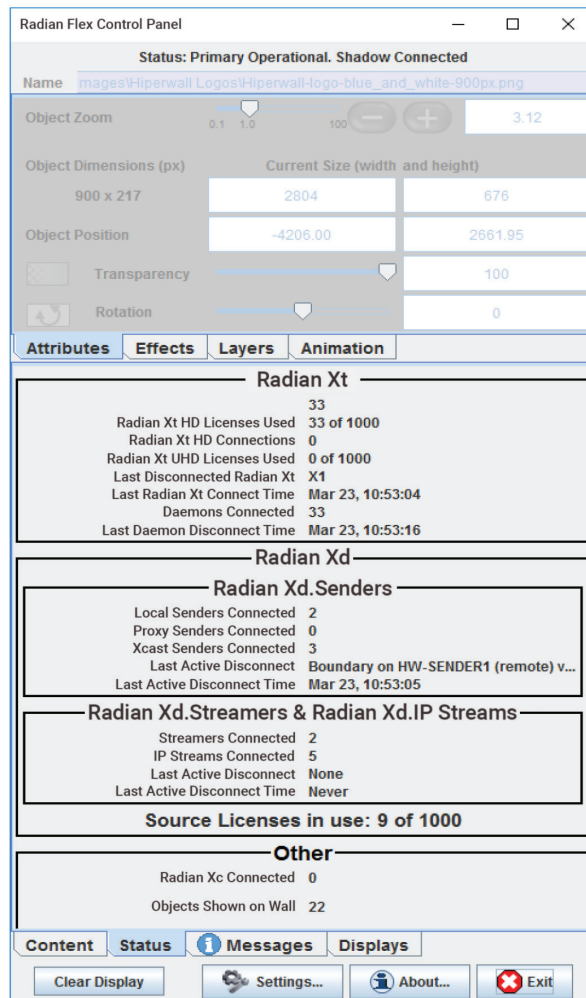
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FIGURE 11-6.

11.1.7 CHECKING AND SAVING STATUS MESSAGES (MESSAGES TAB)

Select the Messages tab at the bottom of the Control Panel to see alerts and a log of significant actions.

1. The items in the messages tab each have a priority: Information, Warning, and Alert. Radian Flex Xa adds an Allowed priority for allowed actions, and it uses the Alert priority for denied actions. Each has a distinct icon, allowing users to quickly see the most important messages.

If Control Panel panes other than the Messages tab are selected, the Messages tab label will show the most critical new message icon, if any. Selecting the Messages tab clears the icon.
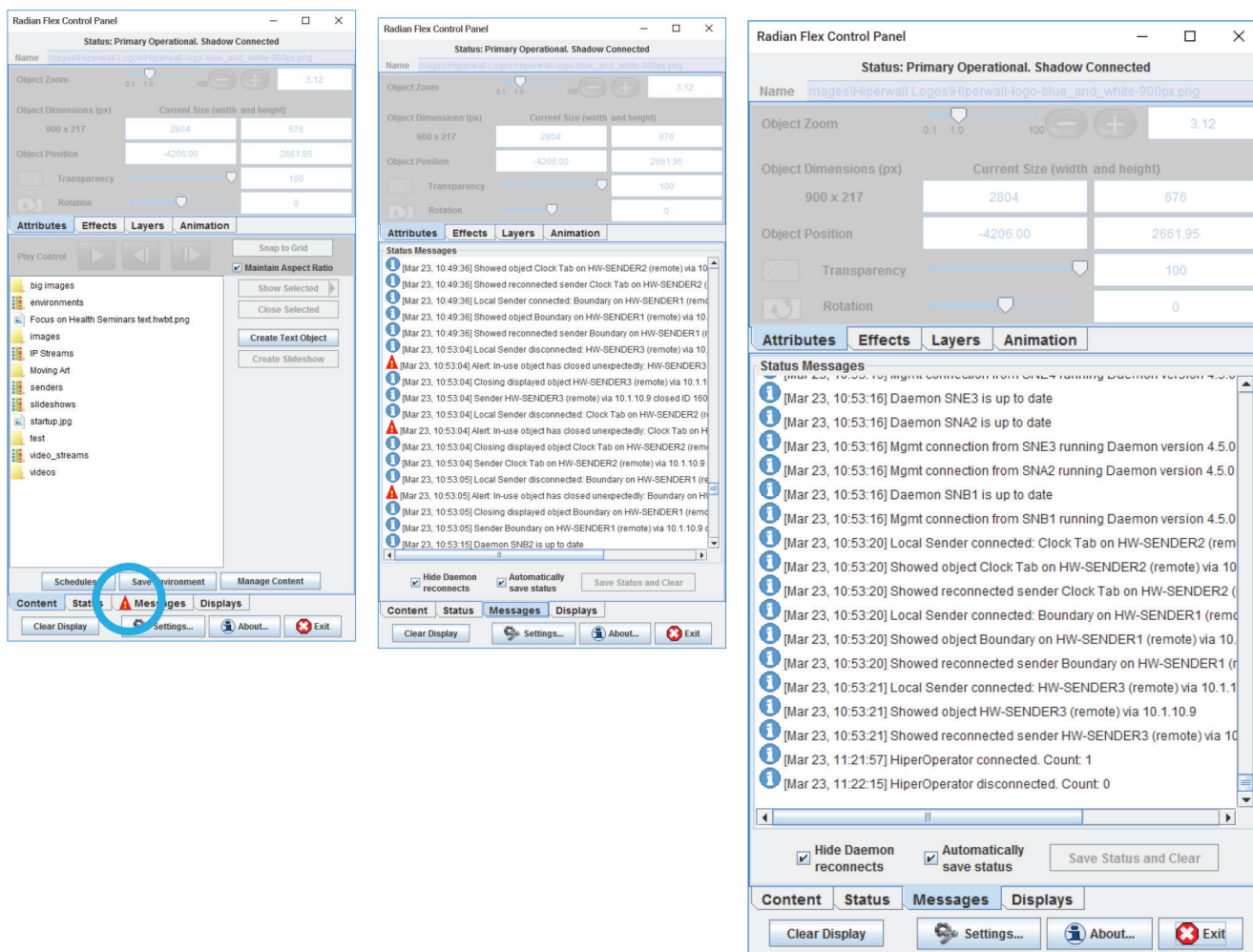

FIGURE 11-7.

2. Select the checkbox to automatically save the status to files in the same folder as the Contents folder. The priority of each message is saved in the file with a tab character separating it from the message itself. This allows importing into a spreadsheet to sort and collate the messages.

3. The Save Status and Clear button saves the current messages and clears the messages tab.

4. Select the "Hide Daemon reconnects" checkbox to reduce the number of messages shown when the Radian Xt UHD or HD Viewer daemons disconnect and reconnect due to heavy network traffic. Significant problems, if any, will still be shown.

11.1.8 DISPLAY SETTINGS AND CONTROL (WALLS TAB)

Select the Walls tab at the bottom of the Control Panel to review the Control Walls and Radian Xt UHD or HD Viewer Computers pane. The pane shows a hierarchy of the walls in the Radian Flex System and all their Radian Xt UHD or HD Viewer displays. If no named walls are present, a "Default" wall will contain all the Radian Xt UHD or HD Viewer displays.
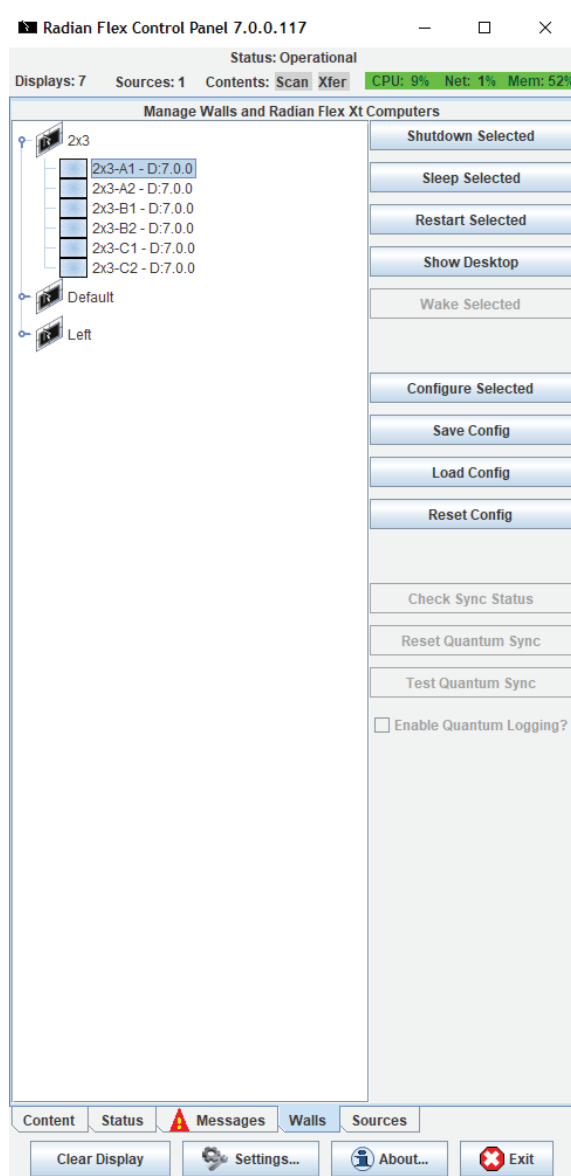

FIGURE 11-8.

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Select one or more Radian Xt UHD or HD Viewer displays or walls on the Displays pane and perform actions on them or change their settings:

◆ Shutdown Selected – Shut down selected Radian Xt UHD or HD Viewer monitors and computers.

◆ Sleep Selected – The monitors go to sleep but the computers are still active.

◆ Standby Selected – The computers and monitors go to sleep.

◆ Restart Selected – Restart the computers and monitors.

◆ Show Desktop – Quits Radian Xt UHD or HD Viewer on the selected computers, allowing support personnel to perform maintenance.

◆ Wake Selected – Wakes up sleeping or shut down Radian Xt UHD or HD Viewer displays, assuming Wake-On-LAN is properly configured.

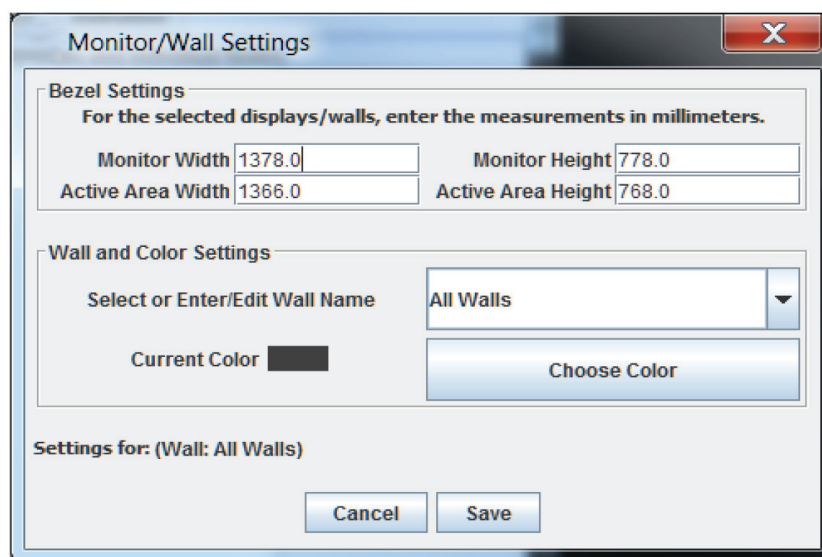◆ Configure Selected – Brings up the Monitor/Wall Settings pane, shown below. Review these options:

FIGURE 11-9. MONITOR/WALL SETTINGS SCREEN

◆ Set the bezel compensation settings. In the Bezel Settings fields, specify the overall size of the selected Radian Xt UHD or HD Viewer monitors and the size of its active area. Measure the overall height and width of the complete monitor and the height and width of the active area of the display panel. See the monitor manufacturer's manual for more information.

Because each wall or group of monitors in your Radian Flex distributed visualization system can have different bezel compensation settings, Radian Flex supports different generations of monitors with differing bezel sizes in a single multi-wall system. (Power user tip: these values can be specified in pixels or any units. The ratio is what matters.)

◆ Click on the "Select or Enter/Edit Wall Name" button to rename a wall (if a wall was selected). Add selected Radian Xt UHD or HD Viewer displays to a pre- defined wall by selecting that wall, or create a new wall containing the selected Radian Xt UHD or HD Viewer displays by typing in a new wall name.

◆ The "Choose Color" button lets you set the color for the display tiles in the Control Screen.

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11.1.9 PERMISSIONS AND ACTIVE USER MANAGEMENT (RADIAN FLEX XA TAB)

Select the Radian Flex Xa tab at the bottom of the Control Panel to manage and control user access to the Radian Flex video wall and distributed visualization system. See Chapter 10 for Radian Flex Xa capabilities and how to configure.

11.1.10 EXIT BUTTON

You can use the Radian Flex Scheduler to schedule when and how your Radian Flex System shuts down or sleeps. You can also click the "Exit" button on the Control Panel – or the close box in the upper right of the Control Panel – to exit the Radian Flex System. Choose from several exit choices, shown below:
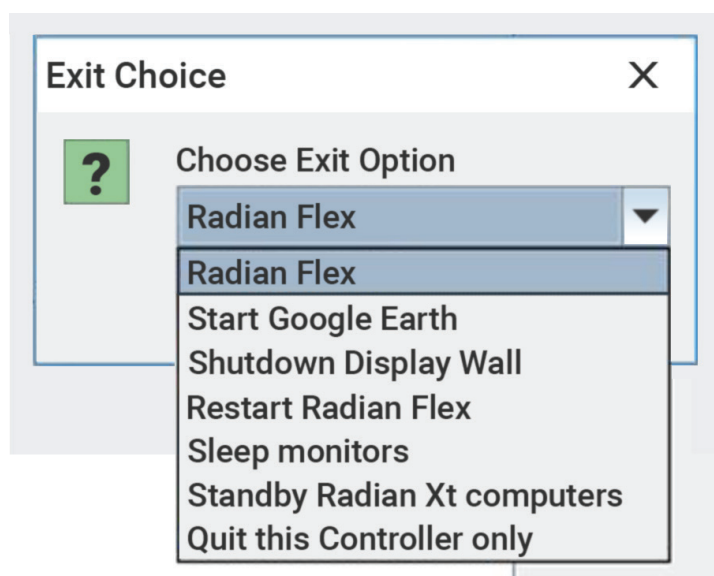

FIGURE 11-10. EXIT SCREEN

- Quit Radian Flex – Quits the Controller and Radian Xt UHD or HD Viewer software.

- Start Google Earth – Only available if Google Earth is installed. It launches Google Earth on the Controller and Radian Xt UHD or HD Viewer displays and allows very high resolution browsing of Google Earth imagery. NOTE: Google Earth support uses an API that has been removed by Google, so this option will be unavailable in future Radian Flex releases.

- Shutdown Display Wall – causes the Radian Xt UHD or HD Viewer computers to shut down and quits the Controller software, but does not shut down the Controller computer.

- Restart Radian Flex – causes the Radian Xt UHD or HD Viewer computers to restart and quits the Controller software.

- Sleep monitors – quits the Radian Xt UHD or HD Viewer software and puts the Radian Xt UHD or HD Viewer monitors to sleep. Sleep is a low power state where the backlight is turned off – not all monitors support sleep. The Controller software continues to run and shows a window with an OK button to wake the monitors.

- Standby Radian Xt UHD or HD Viewer computers – This option puts the Radian Xt UHD or HD Viewer computers into standby mode (a low power state) and shows the window with a button to wake the system. NOTE: The Radian Xt UHD or HD Viewer computers need to be configured in the Windows Device Manager to allow Wake-On-LAN (Magic Packet) to awaken the system from sleep and not to require a password when waking up. See the Radian Xt UHD or HD Viewer software installation instructions in Chapter 3.

- Quit this Controller only – For Radian Flex Pro with fault tolerance, this option allows quitting one of the two Controllers without quitting the entire wall.

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11.2 RADIAN FLEX CONTENT GUIDELINES

Radian Flex software can display many types of content. Content objects must be imported to the Radian Xt UHD or HD Viewer software with the Control Panel's Content Manager before they can be used. Go to Chapter 4 for more information on importing and using content.

11.2.1 STILL IMAGES

1. Image formats: JPEG (.JPG), TIFF (.TIF), BMP, .GIF and .PNG.
2. Transparency is preserved in .PNG and .TIF files with an alpha channel, useful as overlays in slideshows.

11.2.2 MOVIE FORMATS

Radian Flex supports movie formats that allow 4K video playback and high performance (60 FPS) 1080p playback.

The IP Streams software, a Radian Xd component, adds the capability to manage remote IP cameras and RTSP streams (H.264 and MJPEG) and stream them to the wall. See Chapter 6 for more about IP Streams.

Radian Flex software supports video compressed in the H.264/AVC format and audio compressed in the AAC format. These videos can use containers including MP4, MKV and others. In all cases, the video file will be processed at import time to support synchronization on video walls. This processing will not affect the video or audio quality in any way.

The Radian Flex System can display Quicktime movies (.mov, .mp4) without conversion that were imported into an older Radian Flex System.

If you are rendering your own videos to import into a Radian Flex System, use the following guidelines:

1. H.264/AVC video compression

- ◆ 30 or 60 frames per second preferred (30 FPS for 4K)
- ◆ Group size (1 frame interval) of ¼ second or less
- ◆ Bit rate of less than 100 Mbps (fixed or variable)
- ◆ Horizontal and vertical resolutions must be multiples of four

2. AAC audio compression

3. Container: .mp4, .mov, or .mkv preferred, though others may work.

If you have videos in other formats, use one of the many open source video format conversion tools to transcode them to meet the above guidelines. Contact the Black Box Technical Support team for suggestions and profiles for tools that can perform the conversion.

11.2.3 VIDEO AND AUDIO SYNCHRONIZATION ON RADIAN XT UHD OR HD VIEWER DISPLAYS

Smooth display and synchronization of video and audio on Radian Xt UHD or HD Viewer displays is a combination of many factors. Radian Flex software is designed for commodity, off-the-shelf equipment, offering great flexibility in designing a video wall and distributed visualization system tailored to your needs. The hardware requirements in Chapter 2 provide some recommendations.

The Black Box Technical Support team is also a resource. The Technical Support team can listen to your plans and give you advice based on the content you plan to show now as well as your plans for the future. There are steps you can take now to make it easier to display content now and upgrade your hardware and software over time to adapt to new hardware, higher resolution graphics formats, and your organization's plans – contact us at 877-877-2269 or info@blackbox.com

You can improve data flow to the wall by selecting video formats that work well with Radian Flex software. The Radian Xt UHD or HD Viewer software operates at 60 Hz, so 30 Hz and 60 Hz videos play smoothly, but 24 FPS videos will appear to stutter because the interval between frames is uneven (because 60 is not an even multiple of 24). While this is not very apparent with playing back on a single PC screen, it can be quite noticeable when the video is spread across multiple displays in a video wall. The Radian Flex software requires that movies have a width that is a multiple of four. Height is not similarly restricted, but common video sizes, like 1280 x 720 are suggested. Because most commercial monitors are 16 x 9 format, movies will likely fit better if they are 16 x 9.

It is significantly more complicated to synchronize video playback on a multi- display video wall than it is to play a video on a single computer screen, so be aware that positioning multiple high frame rate or very large videos on a single Radian Xt UHD or HD Viewer display can lead to performance issues that may make one or more of the videos play back poorly. Playing more than one large movie on a Radian Xt UHD or HD Viewer display will cause the movies to compete with each other for CPU resources. If the movies do not play smoothly, avoid placing more than one movie per Radian Xt UHD or HD Viewer display. Showing the same movie content multiple times, even on the same Radian Xt UHD or HD Viewer display, does not burden the Radian Xt UHD or HD Viewer display more than showing the content item once.

The Radian Xd group of software has been developed for high efficiency data flow. The Radian Xd Streamer is another solution for playing high-quality, high- resolution movies, because its performance relies on the power of the Streamer computer and the bandwidth of the network, rather than relying on the Radian Xt UHD or HD Viewer computers to decode the movie. Therefore, a 1080p stream of 24, 30 or 60 frames per second can be streamed by a quality Streamer computer over a quality network switch to the wall. The Streamer software supports .wmv movie files and capture devices compliant with DirectShow®. Streamer movies require both horizontal and vertical resolutions that are multiples of four.

A Streamer computer may stream multiple movies or capture streams, but this requires CPU and graphics processor resources, as well as the network interface, of the Streamer computer. Third-party software, such as FFDShow, can be used to make the Streamer accept more movie formats, but Radian Flex cannot guarantee the results of third-party products. FLV and MPEG2 movies are not supported by default, though third-party software may allow them to be used.

There is a short delay between when a frame is decoded on the Streamer software and when it shows on the wall. The Streamer software provides a mechanism to adjust the audio delay so sound output of the Streamer software can match what is displayed on the wall. See Chapter 6 on Radian Xd software. Using Radian Flex Environments is another option to synchronize movie and audio content, discussed in Chapter 7.

QuickTime compatible audio formats are supported and are played on the Controllers where the movie is shown. Connecting an amplified speaker to a Controller will allow the movie's sound to be heard. If more than one movie is playing on a particular Radian Flex computer, the sound from all the playing movies will be heard on the audio output of that computer.

In addition, Windows® media files (.wmv) can be streamed to Radian Flex using Radian Xd Streamer software. Radian Flex can display movies with codecs supported by QuickTime, but smoothness and synchronization depend on the capabilities of the Radian Xt UHD or HD Viewer computers and the number of movies being shown simultaneously. Most commercial displays with embedded PCs are unable to play 1080p QuickTime movies smoothly.

Atom™ and Fusion processors are very low-power, low-capability processors that cannot handle the network protocol processing required for either sending or receiving high-resolution streams. They may not play high-resolution QuickTime content smoothly. Some dual-core Atoms can play some 720p QuickTime movies smoothly, but may not play high bitrate 1080i or 1080p, or poorly encoded ones.

Radian Flex software comes with a powerful range of settings and preferences to customize your Radian Flex experience, including improving data flow to your Radian Xt UHD or HD Viewer displays.

1. Review the settings for your Radian Flex switch in Chapter 3 on Configuring the Radian Flex Network.

2. Optimize your Radian Xd streams by adjusting throttle sliders and other settings to adjust for CPU usage and frame rate for your content – review Chapter 6 on Radian Xd software.

3. On the Control Panel, click on the Settings … button to reach menus and windows for settings and preferences in this chapter. The System Setup tab gives status messages there are buttons for the System Test and the IGMP Multicast Test. Also see information on how to run the IGMP Multicast Test, Chapter 3.

4. Contact the Black Box Technical Support team for advice and assistance in testing and adjusting your Radian Flex settings to maximize frame rate and CPU efficiency for your content. Sign up for a Software Maintenance Agreement to help keep your Radian Flex software updated and expedite support – info@blackbox.com

CHAPTER 11: CUSTOMIZING YOUR RADIAN FLEX

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11.2.4 CONTENT FROM SOFTWARE APPLICATIONS

Flash content, web pages and more can be shown on the wall via Radian Xd Sender or Radian Xd Streamer.

The Sender is a Java® application that is part of the Radian Flex software to enable viewing computer screen content, including proprietary applications, on the wall. Some display content, like DirectX® or OpenGL® games, may not be captured by the Sender, but typical applications work well. Sender software requires a current release of Java so it can work on Mac OS X (Intel® only) or many Linux® systems, as well as Windows systems.

With the Sender software, the performance of both the Sender computer and the Radian Xt UHD or HD Viewer computers come into play. The higher the resolution of the content being sent, the lower the frame rate that can be captured and sent. A very powerful Sender machine, however, can send moderate resolution screens as fast as 20-to-30 FPS and low-resolution screens much faster. If your video wall has Radian Xt UHD or HD Viewer computers that are lower powered, they may have trouble displaying very high-resolution Sender content faster than 10-to-15 FPS, so experiment to find the resolution and frame rate combination that look good for your content.

To get high resolution (up to 1080p) and high frame rate (up to 60 FPS), use Radian Xd Streamer, which is also able to stream the contents of a Windows PC desktop monitor to the wall. This requires a high-quality NVIDIA GPU or modern Intel CPU in the Streamer PC.

The Streamer-based approach provides a very high frame rate (up to 60 frames per second, depending on CPU and GPU) and low latency.

11.3 RADIAN FLEX TIPS AND TECHNIQUES

This section describes some tips and techniques to make the use of the Radian Flex software more enjoyable and more productive. Some tips will be given in a question/answer format, while others will simply be stated below.

Q: Where are all the video switches, amplifiers and proprietary servers and such that are normally used in display wall solutions?

A: Radian Flex only uses software and commodity IP networking for our content distribution. We do recommend high-quality PCs and good managed network switches, but overall our cost is typically a small fraction of the other solutions. Refer to our hardware requirements in Chapter 2 and our system requirements guide, and consult the Black BoxTechnical Support Team for recommendations specific to the content you plan to show and interact with on your Radian Flex System.

Q: What is the difference between a Radian Xd Sender and Radian Xd Streamer? When would I use either?

A: The Radian Xd Streamer is intended for fast-moving video content. It can stream desktop captures, as well as video from movies (WMV, for example), video capture cards, and DirectShow-compliant webcams. It streams video at the resolution and frame rate of the chosen source content. To stream fast-moving video content, the Streamer uses substantial network bandwidth.

Q: What content types support transparency?

A: Any of our content types may be made transparent or partially transparent when displayed on the wall. Certain formats of regular images (PNG and TIFF formats) support an alpha channel that defines transparency in the image. The Radian Flex software supports the alpha channel in these images. It does not support transparency in JPEGs, Movies, or Radian Xd content.

Q: In the network test (in System Setup), the Radian Xt UHD or HD Viewer incoming and outgoing rates are quite different—is that a problem?

A: Probably not. The exact rates are not particularly relevant or scientific, but the incoming rate uses Java® to send the data and is often much slower than the outgoing rate, which uses C++. Important characteristics to look for include: failures (if repeatable, even after restarting the wall, try a different Ethernet cable and/or switch port) or rates of less than 10MB/sec (meaning the Radian Xt UHD or HD Viewer computer may have connected at 100 Mbps rather than 1 Gbps, so try re-plugging the cables, rebooting or replacing cables). Radian Flex software uses the network in ways that stress cheap switches and poor links, so it encounters errors that may not be noticed in a file-sharing and web-browsing environment. Use "iperf" or other network diagnostics if you suspect problems with a node or switch and replacing cables does not help. Refer to the IGMP Multicast Test and System Test available from clicking the Settings … button on the Control Panel.

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Q: When I put portions of several HD movies (or a movie and some Senders) on a single Radian Xt UHD or HD Viewer display, the movie playback seems to slow down. What is going on?

A: Movie playback and Sender decode and display are both computationally expensive. Many computers have trouble keeping up with more than one at a time, so adding several will burden the Radian Xt UHD or HD Viewer computer. Radian Xd Streamer requires much less Radian Xt UHD or HD Viewer CPU, but lots of network bandwidth, so it may be a viable alternative for one or more of the movies you want to display on a single Radian Xt UHD or HD Viewer computer.

Q: While playing multiple movies on a single Radian Xt UHD or HD Viewer display slows it down, multiple copies of the same movie (or Radian Xd Sender) do not. Why?

A: The Radian Flex software is written to be efficient, so it only needs to decode such "cloned" objects once and can then display them several times essentially for free.

Q: Why does Radian Xd content sometimes show up with a gray fill on the Control Screen and their contents aren't updated? They look fine on the wall.

A: The Controller only displays the Radian Xd content when they are selected in order to avoid using unnecessary resources. To see the content, click on the object. The contents are always displayed on the display wall. Thumbnail views of Radian Xd content are shown on the Controller for unselected objects, but thumbnail delivery may be slow on constrained networks or slow machines.

CHAPTER 12: FLEX XA: MANAGING USERS AND ACTIONS

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12. RADIAN FLEX XA: MANAGING USERS AND ACTIONS

Manage and control access to Radian Flex software with Radian Flex Xa, a new capability in the Radian Flex Controller Software.

Radian Flex Xa provides options for user authentication (login), tracking of user activities for accountability (logging), and choosing which actions users can perform (permission checking). If you do not want users to log in, create an automatic login. Customize Radian Flex Xa for the degree of control that you need.

Radian Flex Xa is included with Radian Flex Pro licenses and is an option for Radian Flex licenses.

12.1 SUMMARY OF HOW RADIAN FLEX XA WORKS

During software installation, the Radian Flex Controller software will prompt you to set up Radian Flex Xa and create an administrative user.

You can configure Radian Flex Xa to require individual users to log in each time they use the Radian Flex System. From the Radian Flex Xa tab in the Control Panel, make sure that the Radian Flex Xa auto-login setting is off for the Controller and also turn on Radian Flex Xa authentication for Radian Xc — ControlBridge Operator and Radian Flex Xs Services API Control License. Select the Radian Flex Xa devices that require logging-in and select which users can use which features of the Radian Flex software, discussed in the sections below. Radian Flex Xa will track the activities of individual users for accountability.

Or, you can configure Radian Flex Xa to automatically log-in an administrator whenever the Radian Flex System is restarted, making it possible to use Radian Flex software without individual users needing to log-in. If the Controller is in an auto-login state, Radian Flex Xa authentication is automatically turned off for Radian Xc — ControlBridge Operator and Radian Flex Xs Services API Control License. If auto-login is being used, Radian Flex Xa tracks the activities of users without identifying individual users.

 It is always necessary for administrators to formally log in from the Control Panel's Radian Flex Xa tab before making changes to Radian Flex Xa. When using the auto-login feature, administrators do not have permission to change settings unless they are logged-in.

Click on the Radian Flex Xa tab on the Control Panel for the Administrator button. Click the Administrator button to reach windows for adding users, managing groups, and specifying each group's permissions. Radian Flex Xa organizes users according to groups. Use predefined groups or add new groups, as needed.

There must always be at least one administrator in the Admin group for Radian Flex Xa to function.

Check the Messages tab on the Control Panel for activity logs. The logs show who performed each action and whether that action was allowed or denied. This detailed logging provides accountability of users for their actions.

Review the sections below for details on how to configure and use Radian Flex Xa.

12.2 OBJECTS AND ACTIONS

Radian Flex Xa checks whether a logged-in user has the permissions to perform a requested action on a selected object.

The objects are defined by type, so sources can have different permissions than Radian Flex Environments, for example. The controlled actions are those appropriate to the object type that the user is trying to apply them to.

For detailed examples of the defined objects and actions, and how to manage permission for them, see the Radian Flex Xa Administration section.

CHAPTER 12: FLEX XA: MANAGING USERS AND ACTIONS

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12.3 USERS AND GROUPS

Use Radian Flex Xa to authenticate people who use the Radian Flex System as well as external programs and devices that access the Radian Flex Xs Services API Control License interface.

Users are people who login to the Radian Flex System to use it. Users can also be defined for external programs and devices that access the Radian Flex Xs Services API Control License interface, so they can be authenticated, tracked, and have their permissions checked.

Groups are collections of users and are where Radian Flex Xa permissions are defined. The Radian Flex Xa software provides a default set of groups that are predefined, but you can change the groups and add more groups. Users may be in multiple groups and must be in at least one group. A user's set of permissions is the union of all the permissions of all the groups to which the user belongs.

Users default to a predefined "Users" group when they are created, but users can and should be assigned to other groups appropriate to their duties. The Radian Flex Xa predefined groups are:

◆ Admin – This group is for Radian Flex Xa administrators and has all permissions. The name of this group cannot be changed. At least one administrator must exist.

◆ Users – This is the default group that all created users must belong to. It defaults to no permissions, but an administrator can change permissions, as desired.

◆ Staff – This group is for normal system users who can perform most Radian Flex actions, but do not create content or manage the system. Permissions may be changed by the administrator.

◆ PowerUsers – This group is for Radian Flex system managers and content creators who can perform any Radian Flex action other than administrate the permissions.

Radian Flex Xa administrators are members of the Admin group and can perform any Radian Flex action, including administrating permissions. In order to prevent the Admin group from being empty, administrators cannot remove themselves from the Admin group, so another administrator will have to do so. There must always be one or more administrators in the Admin group for Radian Flex Xa to run.

12.4 INITIAL RADIAN FLEX XA CONFIGURATION

When a Radian Flex System with Radian Flex Xa first starts, the usual Settings and Preferences window is shown. Configure settings in the System Setup tab as described in Chapter 3, Installing the Controller Software.

Once those settings are saved, the Control Panel initializes and presents a window asking to initialize the Radian Flex Xa Management System, as shown next.

Initialize Radian Flex Management System   ✕

ⓘ **New Radian Flex Management System must be initialized prior to continuing.**
Please fill out the new admin user information and click the Save and Close button when finished.
Note: Password id REQUIRED. Xs Services Key is Optional.
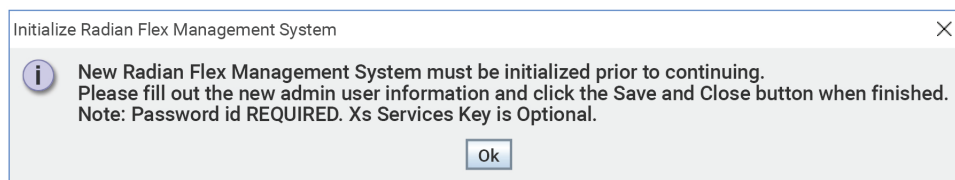
Ok

FIGURE 12-1. INITIALIZE MANAGEMENT SYSTEM

After clicking OK, the Radian Flex Xa software presents a New User window – this is how the first administrator is added. Radian Flex Xa needs at least one administrator user in order to function. Fill in the name information, click Set Password and enter and confirm the password, then click Save & Close. The example below has a user name of "admin," but the administrator can have any valid user name and the name does not have to be generic.

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FIGURE 12-2. NEW USER SCREEN

Once the administrator is created, the Radian Flex Xa tab appears in the Control Panel and the Radian Flex System enters normal operation.

In a Radian Flex Pro running two Controllers for fault tolerance, the administrator only needs to be created on one of the Controllers – the one that comes up as "primary" – as the shadow Controller will automatically get the Radian Flex Xa settings from the primary Controller.

12.5 NORMAL OPERATION (RADIAN FLEX XA TAB)

After the initial configuration of Radian Flex Xa, a new Radian Flex Xa tab, shown below, is added to the Control Panel. The Radian Flex Xa tab is the hub for logging in and out of the Radian Flex System, changing your password, and, for administrators, defining user permissions.

For Radian Flex Systems running two Controllers for fault-tolerance, during normal operations, Radian Flex Xa changes made on either Controller will automatically transfer to the other one. If you make changes when only one Controller is operating, note that the shadow Controller always gets the permissions settings from the primary when the shadow starts.

12.5.1 LOG IN, LOG OUT, AND CHANGE PASSWORD

Click on the Radian Flex Xa tab to see the Radian Flex Xa User Management window. The top of the window shows the list of logged-in users (none in the example image), as well as some buttons below.

- The Login button allows a user to log in. As expected, the Logout button allows the logged-in user to log out.

- When a user is logged in, the Login button changes to the Change User button. Click the Change User button to log in a different user, which also logs out the previous user.

- Ordinary users can change their password using the Change Password button, though that button changes for administrators (more in the Radian Flex Xa Administration section.
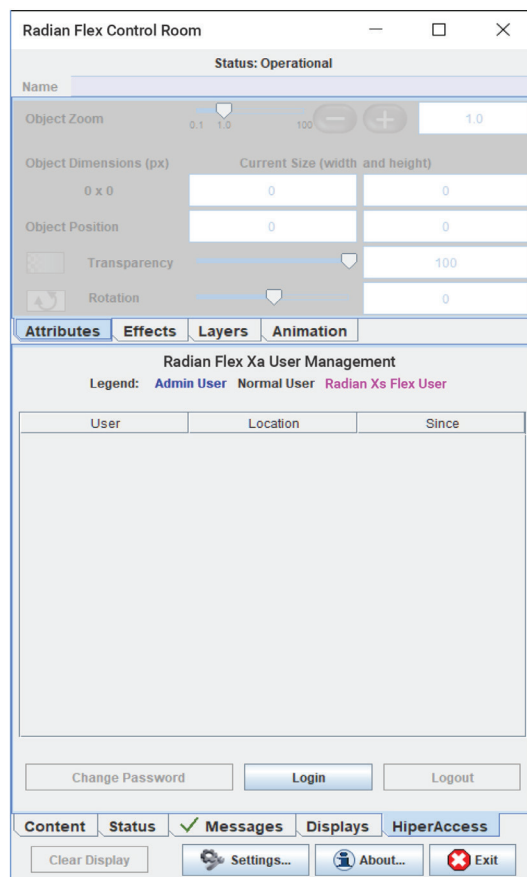
FIGURE 12-3.

12.5.2 DENYING ACCESS AND LOGGING ACTIONS

Once a user is logged in, Radian Flex Xa checks all their actions against their permissions:

- If an action is allowed, the Radian Flex System will perform the requested operation, but if the action is denied, the operation is prevented.

- Either case is logged in the Messages tab along with an icon that identifies whether the action was allowed or denied.

- This means that a user that does not have permission to clear the wall will not be able to clear the wall. Users that do not have permission to open certain kinds of content can't open that content. Unauthorized users cannot change the system state, import or manage content, or do any other activity a Radian Flex System can perform.

If no user is logged into a Controller:

- The Controller is locked out from doing most activities.

- The Control Panel defaults to the Radian Flex Xa tab, but the Status tab and Messages tab are also accessible.

- The Content and Displays tabs are locked out, and any attempts to select them will switch back to the Radian Flex Xa tab.

- Any actions attempted, such as trying to change settings or quit the Radian Flex software, will be prevented and logged as attempts by the "Default User," which has no permissions.

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12.6 RADIAN FLEX XA ADMINISTRATION

Click on the Radian Flex Xa tab to see the Radian Flex Xa User Management window. The window lists Admin Users – Radian Flex Xa Administrators – in blue text and provides an "Administrator" button for more capabilities.
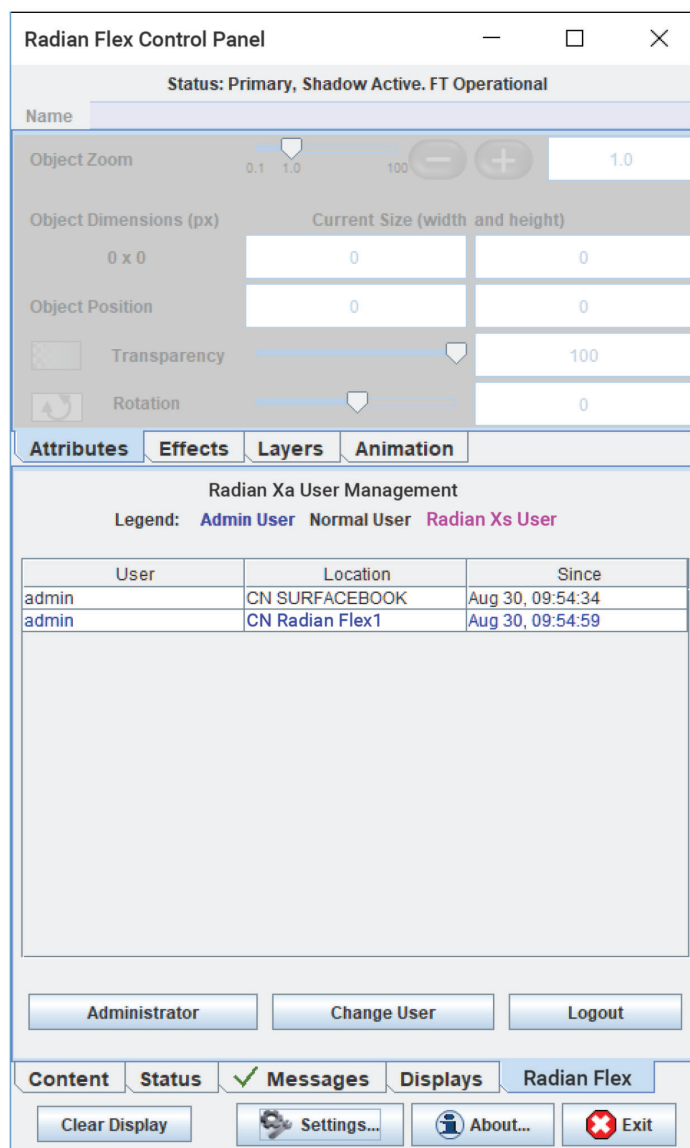
FIGURE 12-4.

To begin, press the Administrator button to bring up the Radian Flex Xa User Management window.

Here, Radian Flex Xa administrators can see all the logged-in users and, when needed, can force them to be logged out from the system (in case their permissions were changed or they have been deleted).

NOTE: If the user still exists and their password hasn't changed, they can log back in, which will happen automatically if they are logging-in from Radian Xc — ControlBridge Operator.

Use the Manage Users button to add, delete, or change users and groups.

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Use the Manage Groups button to change permissions for groups. Both buttons are discussed in detail, next.
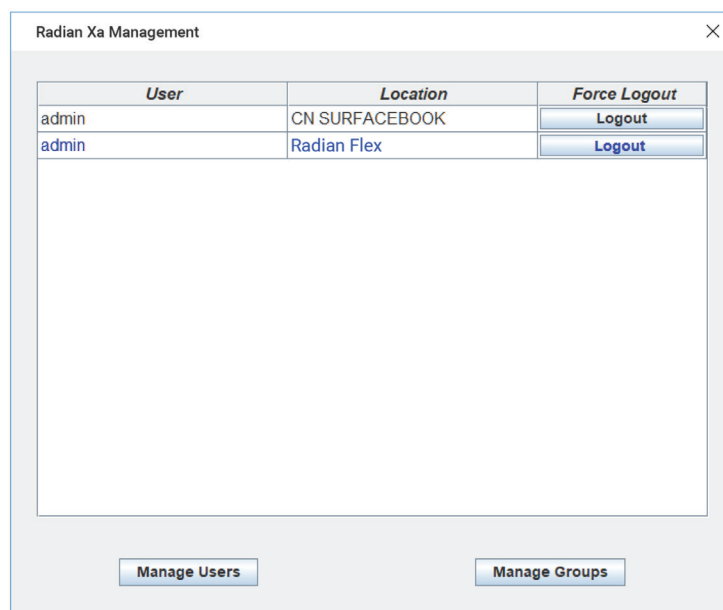
FIGURE 12-5.

12.6.1 ADD, DELETE, OR EDIT USERS

Click on the Manage Users button, shown above, to bring up the Manage Users window, shown below. Use the buttons on the Manage Users window to add a new user (New User), change a user's information (Edit User), or delete one or more selected users via the Delete User(s) button.
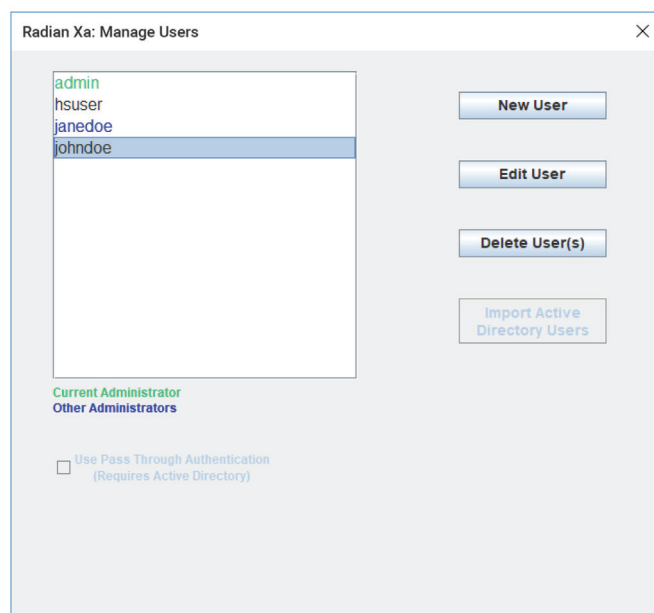
FIGURE 12-6.

Click on the New User or Edit User buttons, shown above, to reach windows for setting up or modifying the name, password, and permissions of each user.

Delete users with the Delete User(s) button.

Future versions of Radian Flex will allow import of users from Active Directory and the use of Pass Through Authentication with Active Directory, so placeholder controls are present.

The New User and Edit User windows are very similar, but the Edit User window, shown below, has a button to show the user's permissions, the View User's Permissions button.

FIGURE 12-7.

The Generate New Key button, shown in the Edit User window, above, makes a key that is used for Radian Flex Xs Services API Control License (External Interface) authentication. More information about that can be found in the Radian Flex Xs Services API Control License authentication section.

12.6.2 VIEWING A USER'S PERMISSIONS

Click on the View User's Permissions button in the Edit User window, shown above. Radian Flex Xa gathers the set of all the permissions from the user's groups and presents them in the Permissions window as shown below. This collection of permissions is read-only.

CHAPTER 12: FLEX XA: MANAGING USERS AND ACTIONS

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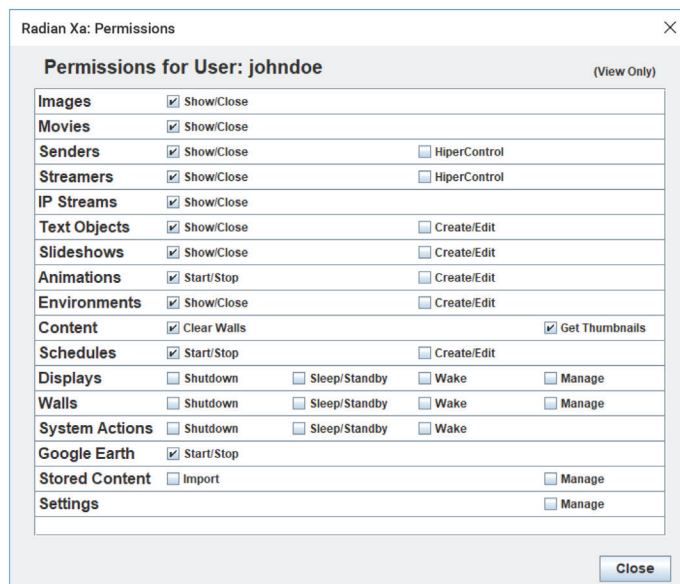LEAVE THE TECH TO US
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FIGURE 12-8.

12.6.3 CHANGING A USER'S PERMISSIONS

To change a user's permissions, either change the permissions for a group the user belongs to or remove the user from a group that grants those permissions. Do both from the Manage Groups Window.

From the Radian Flex Xa tab on the Control Panel, click on the Administrator button and then the Manage Groups button to go to the Manage Groups window, shown next.
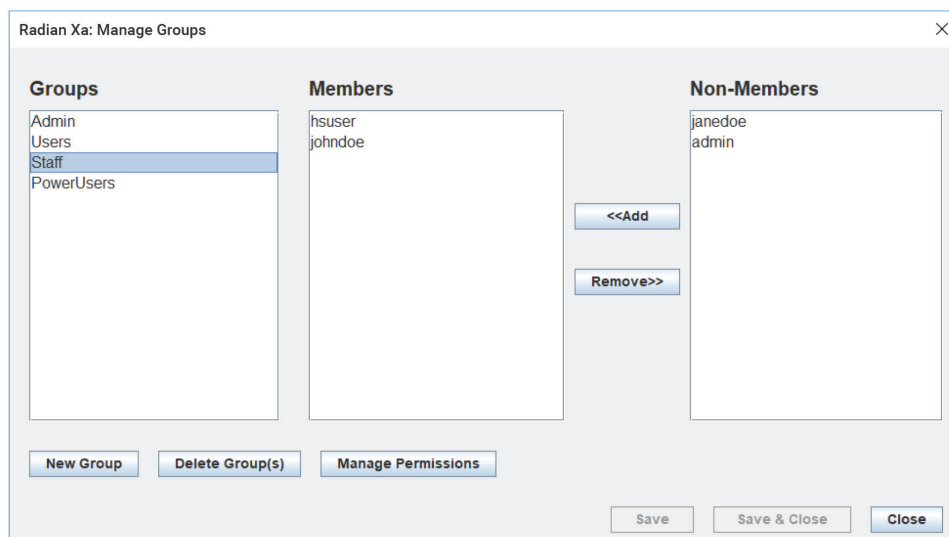
FIGURE 12-9.

Select a group name in the Manage Groups window to see the members and non-members.

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◆ Use the Add and Remove buttons to move users into and out of groups (again with the exceptions that an Admin member cannot remove him/herself from the Admin group, and the Users group membership is only changed by creating new users or deleting users).

◆ Create or delete groups with the New Group and Delete Group(s) buttons.

◆ Change permissions for groups with the Manage Permissions button. (Note that group membership changes must be saved before the Manage Permissions button is enabled.)

Click the Manage Permissions button to go to the Manage Group Permissions window, shown below. Use this window to add or remove permissions from the group selected in the Managing Groups window, above.

The Manage Group Permissions window, shown below, shows all the object types that can be managed (left column) and the permissions appropriate for each type.

FIGURE 12-10.

Note that Sources are broken out by type to allow a fine granularity of control. For instance, Radian Xd Senders and Streamers allow Radian Xs (KVM or Keyboard-Video-Mouse), while IP Streams sources don't. The fine granularity of control allows members of a group to show or close Radian Flex Environments, for example, but not create them. Radian Flex Xa allows for multiple classes of users – managers, content creators, ordinary users, etc. – that each have different permissions and responsibilities.

Again, to check exactly what permissions an individual user has, select that user in Manage Users and check with View User's Permissions. Adjust them by managing their group membership and managing the permission of those groups.

A future version of Radian Flex may have a mechanism to deny specific permissions on a per-user basis. Depending on feedback from customers, we may implement that functionality and enable that button in the future.

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12.6.4 AUTO-LOGIN

Radian Flex Xa provides beneficial capabilities for customers that want to limit access to their Radian Flex System and have strict accountability for actions, but some customers do not need these capabilities and want their Radian Flex System to act like it always has. For this reason, Radian Flex Xa provides settings that will bypass the hassle of logging in. These settings are only available to an administrator account, so such an account must be created and must exist in order for these options to be used.

In the Controller Preferences tab of the Settings window, an option allows an administrator to select a user to automatically log in on this Controller. Any user that has been created in Radian Flex Xa can be chosen, and all of the permissions associated with that user will be enforced once that user is logged in.

To make Radian Flex Xa act like a Radian Flex System without Radian Flex Xa, choose or create an administrator. To restrict some actions, choose or create an administrator with fewer permissions.

NOTE: Each Controller in a Radian Flex Premium system can have a different user logged-in automatically, if desired.

When a Controller starts, the chosen user is automatically logged in. To stop a user from being logged-in automatically, select the None option instead of a user.

NOTE: If an administrator is chosen in the list and automatically logged-in, that user does not show up with the administrator colors in the Radian Flex Xa list. Such a user can perform any action in a Radian Flex system, except manage Radian Flex Xa administration operations. To administer Radian Flex Xa, the user needs to press the "Change User" button and login with their password, at which point, the Radian Flex Xa administrator actions and options become available.

The other option provided in the Controller Preferences tab is whether to require authentication (login) from Radian Xc — ControlBridge Operator applications. If so, users will need to provide their Radian Flex Xa username and password to be able to use Radian Xc — ControlBridge Operator. If the option to not require authentication is chosen, then Radian Xc — ControlBridge Operator will behave as if Radian Flex Xa is not present, no login is needed and all actions are available. Actions will continue to be logged in the messages tab, however, grouped together, not as individual users.

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APPENDIX: DISCLAIMER/TRADEMARKS

A. DISCLAIMER/TRADEMARKS

A.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

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1.877.877.2269

NOTES

NOTES

NEED HELP?
LEAVE THE TECH TO US

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