Introduction to the LOR Visualizer/S4 Changes

Michael S. DeMaria
LOR Showtime Software Developer
Good morning/afternoon. My name is Michael DeMaria, and I am one of the software developers for Light-O-Rama. I am the lead developer and architect for the LOR Visualizer which is what we will talk about here today.

At the end, we’ll have a Q&A session. But I’ll also stop after each major section and see if something needs to be clarified/etc. Please don’t hesitate to speak up during those times if there is something you didn’t understand. If you would rather, you can also contact me via eMail. My email address is easy to remember: mike@lightorama.com
The session is geared for beginner and intermediate Visualizer users. For those of you who have used the Visualizer in S3, I will be highlighting some of the differences in S4.

To start, I’ll give you a little history about the Visualizer. I’ll give a quick overview on what the visualizer can do for your stage, and some of the things it shouldn’t be used for. We’ll compare the Visualizer to the existing animator, and then from there, we’ll move up to some of the core concepts, which starts the meat and potatoes of the class.

Once we are comfortable with the concepts, we’ll create a working sample Visualizer. While doing that, we’ll explore how to use the editor, how to draw lights, edit, and use some of the included wizards.

Once built I’ll show you how to actually simulate your stage using actual sequences being run by the Sequence Editor.

If there is time, we’ll cover more advanced topics like using Reference Files, Running the Channel Wizard, Importing and exporting fixtures and props.

At the end we’ll have a few minutes for Q & A.
History and Initial Concept

- Existing Showtime Animator
- Holiday Lights Designer

The initial design of the Visualizer was started in mid 2009. Originally it was envisioned as a 2D drawing application that would be released as part of Showtime Suite S2. The original design was not much more than being able to draw lines of bulbs, and wire those bulbs to channels which the rest of the suite could control.

This sounds simple, but was actually a radical step away from the exiting ‘Animator’. The animator was much more a ‘raster’ type drawing program where blocks were assigned to be a single channel. For those people who were using multiple colors on something, you needed to stack or otherwise find ways to represent those multiple colors in the same spot. You drew with channels already defined.

The visualizer on the other hand was seen as more of a designing tool with ‘vector’ type graphics: The user would specify the start and end points of a string of bulbs, tell the system what channels/colors that string represented, and the Visualizer would fill the points in between with the required bulbs. This would lead to much more realistic simulations. The visualizer was also designed to be completely separate from the sequencing aspects of the suite. That made the Visualizer much more abstract – you could plan in it without being bogged down by physical connections.

At the time, there was another software package called Holiday Lights Designer could be controlled by S2. However since it was initially created as a design program for ALL kinds of holiday displays, not just those driven by LOR, it was a little more bulky that what was needed. Adding to it’s demise, the company that developed it appeared to stop supporting the product. The decision was made to create an advanced designer and simulator that would be completely under LOR’s control.

By the end of 2009, we had a working version of the Visualizer that could simulate regular lights successfully. 2010 saw the advent of Cosmic Color Devices and RGB which required a radical shift in
how the Visualizer would render graphics. The visualizer release was therefore moved into S3. In July of 2011 we released the beta version of S3, and in October we released to the general public.
So all that history is great, but what *IS* this thing called the Visualizer? We like to tell people that it is a ‘Planning and Simulation’ tool. Just as confusing as it sounds right?

Ok, in simplest terms, the Visualizer allows you to bring in a picture of your ‘stage’, draw lights on that stage, and then simulate what things will look like when your actual show is running. Since this is the Christmas Expo, we’re going to be talking about Holiday Light Displays, however the visualizer doesn’t really care what your stage is.

With the Visualizer, there’s no need to drag out controllers and oodles of lights. Everything is right there on your screen.
If I could tell you one thing that will make your life MUCH simpler in terms of using the Visualizer it’s that you should NOT be going for photo realism. Without trying too hard, the Visualizer can give you a great looking stage simulation. But its main job in life is to *simulate* LIGHT BULBS, not be a Pixaresque rendering engine of Maya created 3D models. For that combination, expect to spend upwards of about $10,000 on software, and another 20-30 thousand on hardware 😃, and many HOURS of work to animate just a few seconds.

Can you draw a great photo realistic looking blow mold in the Visualizer? You sure can if you spend the time. But really you shouldn’t. Not only will it take you hours, but the performance of the visualizer may suffer, and you won’t gain much. When dealing with normal lights, you also shouldn’t be too concerned about getting every bulb in a perfect position. If you have a wreath on your house and it has 4 different colored bulbs on it, DON’T go back to last year’s picture and try to place the red bulbs EXACTLY where the red bulbs should be. Get a couple of each color on there so they look good and move on. Remember – this is a SIMULATION.
The Showtime software suite has 2 different tools to help you design your light show – The Animator, and the Visualizer. The Visualizer has been available now since the first release of S3. The visualizer is much more advanced that the Animator, with a lot more features and better editing.

However, you may already have a bunch of time invested in an Animator and/or existing sequences you believe are just fine. If you are one of those people who has an animation set up that NEVER needs to be changed, AND a stage that never changes, AND you never intend to add new channels, or anything advanced. Sure. Stick with the animator.

But if you are one of those people that constantly adds things, adds channels, or will be getting into RGB, and or advanced devices like pixels, Take the time NOW to create your visualizer and stick with it.

Please remember however that if you choose to continue to use the Animator that no new development will be done for it. That means things like RGB, Cosmic Color Devices, Flood Lights, and any other new technologies that will come out in the future will NEVER be supported in the Animator. To give you an even MORE STERN warning – The animator has been deprecated and not supported for 2 major revisions now. At any time we may decide to just completely gut it from the suite.
completely. Now is the time.
This may be the first time you are hearing this, so this could come as a shock to you: “You are spoiled rotten”.

There is so much computing power available out there that it is hard to remember a time when you had to optimize whatever it was that you wanted to do. Most of you have more computing power, more storage, more raw CPU power in your pocket than the Mainframes I cut my teeth on in the mid to late 1980’s. Today you are spoiled by smooth, 60 FPS 1920x1080P.

Skyrim here, one of my favorite games, can do that on my sub $1000 computer. So why can’t the visualizer? I can give you 92 million reasons. The development cost of Elder Scrolls V was over $92 million dollars, and actually re-used a lot of code/engine from it’s predecessor, ES IV. The newest version, Elder Scrolls On-Line is rumored to have cost over $200 million.

Software like this has so much clout with the industry, that hardware manufacturers actually tweak their designs to work with specific software, not the other way around. The projected revenue from gaming ALONE in 2014 is over 100 BILLION (with a B). “Hey Dan! Has LOR made it’s first 100 Billion (with a B) yet?”

That’s not to say that we haven’t improved. In fact, comparing the S4 Advanced Rendering Engine to the old S3 engine would be like comparing Skyrim here to
mmmmmm..... Not Quite.....
Yea, that is about it.

That is not saying that S3 rendering engine is bad. Pong here was amazing for its time, and so was the old rendering engine. But the NEW engine is light years ahead.

Takes advantage of processing power of recent vintage video cards – even ones built onto a motherboard.
Many times faster than the old rendering engine (We say 5 or more, but that’s only because we had to pick a number.)
Has successfully rendered displays with 20,000 pixels –
Beta testers said the visualizer was more than enough to justify the cost of a license renewal/Upgrade

Is enabled by default in S4, however can be turned off if problems appear
Does have some minor differences from the old rendering engine. See the help file.

Use it. Don’t look back.
Finally! Let’s get into some of the core concepts of the Visualizer. At its heart, the Visualizer is really concerned with 3 things: Channels, Fixtures and Props.

While channels are the lowest-level thing you will deal with in the Visualizer, let's instead first talk about Fixtures. What exactly is a fixture? At its heart, a fixture is a collection of channels and additional parameters that tell the Visualizer how to display your lights. For example, there is a ‘String’ fixture. That means that the type of lights it will display can be thought of as Mini lights or rope light. There are several different types of fixtures, which include strings, floods, single bulbs, CCDs and DMX Pixels.

Physically, a fixture represents 1 physical aspect of your display and the channels assigned to it. What that physical aspect is really depends on you and what the Visualizer considers a collection of channels. For example, let's say you have 4 strings of different color lights on the gutters of your home, each of which is controlled by a separate channel. You would most likely then create the ‘Gutters’ as a SINGLE string fixture with 4 channels. Those channels all occupy a single location. However, now let’s say you have a ‘talking face’ made of mini lights. Each different mouth shape would be a separate fixture with a single channel since they occupy different physical spaces.
About 5 years ago, a confluence of related events occurred. The cost for LEDs began to drop significantly. RGB LEDs became commonplace. Patent disputes/licensing on pixels were resolved. We added support not just for DMX but for E1.31 since large venues that had a lot of money tied up in it started coming to us. And the pixel explosion took off.

But when S3 released, Pixels were still on the pricey side. We released S3 along with our Cosmic Color Ribbon, and were pretty comfortable with the Visualizer being able to handle 12 CCRs. What we didn’t expect were users that were going to have 20,000 pixels. Frankly at the time it was unthinkable – every DMX universe (170 pixels) was going to require a DMX adapter (not cheap) along with cabling etc. A CCR tree—much like the one Brian Bruderer demonstrated back then, would be impossible to handle with DMX. The Visualizer took advantage of knowing how CCRs work, but did not leverage that into DMX Pixels. With Release 4, that has changed.

This New fixture type for the Visualizer is called the ‘DMX Pixel Universe’. Works much like a CCD does in S3. Allows for up to 170 pixels per fixture. DMX Pixels no longer must be single fixtures.
Channels can not exist without a fixture. The fixture denotes the physical location of the lights, while the channel ties back to the Sequence and controls when the virtual light is on or off. If you have used Showtime before, you are going to be very familiar with channels.

Different fixtures and ‘channel types’ have different channel requirements. For example, the ‘String’ fixture can be thought of as multi-wire rope light, or bundles of lights that some call ‘Super Strings’. A string fixture can have from 1 to 16 channels assigned to it. If you assign a single color to a string, it will consist of bulbs of that one color and all of them are controlled by that 1 channel. If you assign 2 channels to a string, every other bulb is controlled by channel 1, and the remaining by channel 2. For 3, every 3rd, etc.... It is perfectly acceptable that 2 separate channels have the same color, for example single color chasing rope light, but a channel can NOT be duplicated in a single fixture.

We’ll show some of the other channel requirements a little later.
There are several ways you can assign/reassign channels in the visualizer – something we call ‘wiring’.

The easiest way is to use the channel settings box and set each by hand. You can also load a reference file and choose to update them with that. Advanced users can use the channel wizard if your fixtures are assigned to a prop, or automatic update with reference files.

You can ‘wire’ channels by hand by selecting things like Device Type, Unit, Circuit yourself.

....Or....
You can load sequences and channel configurations into the Visualizer to help wire channels.

....Or....
You can use a combination of both.
This is an advanced topic, but I want to touch on it here for a second since it can be confusing. There are some fixtures that do NOT require you to create channels for them. Instead, they automatically create channels based on their Network/Unit ID or Universe and physical pixel order number.

Since these fixtures do not have definite channels assigned to them – that is, until you place the Visualizer in Simulation mode, we have to compile them. To compile them we take all the advanced fixtures on a single network address (Net/UID or Universe) and combine them. There are a few rules that you need to follow because of that. The rules are documented in the Help File, but let’s talk about......
In S3, Cosmic Color Devices were required to have exactly 50 pixels with no gaps/duplicates.

In S4 duplicates are still NOT allowed. However:
Gaps ARE allowed (after pixel #1)
CCDs need 50 or less pixels, DMX 170 or less.
What is a prop? Simply, it’s a collection of fixtures that all group together in some way. Since this is the Christmas Expo, let’s talk about something called the Mega Tree. The Mega tree will consist of several ‘sections’, each section controlled by 1 or more channels for different colors. Each of the sections would therefore be a fixture – a collection of channels in 1 physical location. However, a single slice of this tree can’t stand on its own. So we assign all the slices to a single object called a PROP. We can now modify those fixtures as a group.

The visualizer will automatically create props when using some fixtures, however you are free to create your own and assign fixtures to them as needed.

A fixture can only be part of a single prop.

For example, if we want to move the tree we only need to move the PROP to a new location and not each section/fixture separately.
So those are the base concepts. Let’s look more at the Visualizer itself. The editor window is the main area where you will be doing your drawing and simulating. The main screen of the editor consists of the Toolbars (top) Drawing area (main window), selection area (list at right), and the status bar (bottom).

If you have ever used any graphics editing program, say like Microsoft Paint, you are probably already familiar with the basic commands of such a program, and the Visualizer uses those same concepts.
There are 4 toolbars in the visualizer that you should be familiar with. One is a standard menu bar. The other 3 Visualizer specific toolbars are called the ‘Edit’, ‘Draw’ and Option bars. If you would rather use menus, all of the commands on the toolbars can be found in the appropriate menu.

Edit toolbar
The edit bar has many of the same functions that any editing program does. There are commands to cut/copy/paste/undo/redo, as well as some commands that are unique to the Visualizer, like ‘Send Home’ and ‘Move to Background’. We probably won’t have time to discuss them all. If you’d like to learn more about them, please consult the help documentation.

Draw toolbar
The draw bar has all the commands that have to do with creating fixtures and props, and running the simulation.

Options toolbar
The options bar has several controls to quickly change the appearance of the editing environment – you can do such things as turn off the fixture/prop names, change tool handle colors, reduce the brightness of the background and the like.

You can move the toolbars around and combine them as you like. To do that, simply grab the vertical bar at the left of a toolbar and move it to a new position.
Most everything I am going to talk about for the next few slides is covered in detail in the Visualizer Tutorial.

I will be moving fast through a lot of these things. If you can't keep up, remember the tutorial is your friend. Depending on how fast we make it through all of this, I will demo as much as I can at the end.

[Nenene Sumiregawa from ‘Read or Die’]
If I could give you a second thing to make your life easier (wait! I can! I can do it now!), it’s to keep your simulation size and background graphics as small as possible. For the simulation size, I am talking in terms of Pixels. If you try to run a simulation in 1920x1080 – which is full on HD resolution, you are going to have a bad time!

Instead, try for something around 800x600. We are not going for photo realism here, but a SIMULATION. You may even want to break your stage up into several different Visualizer files – remember, unlike the Animator the Visualizer is NOT tied to a single sequence.

For the background picture, you should ensure that the file size is as small as possible. Multi-Mega pixel cameras today can take pictures that are 8-10 Megabytes in size. Don’t use these directly. Instead, first load them into an editing program - Microsoft Paint which is included with Windows will work fine, resize the photo to the size of your simulation, and then save the photo as a JPEG.

Just remember – SMALLER is always faster!
Basically, if there is a type of light you should be able to either create it directly, or use these tools to create something that looks and behaves like the light you have.

Each different light has different requirements and uses. You won’t use ‘strings’ for pixels, but you could use a flood for a Cosmic Color Flood.
Drawing wizards do really nothing more than draw lights for you quickly. You could perform the exact same steps on your own, it would just take longer.

There are multiple different Wizards available, and sometimes a wizard can be used to create multiple different things. For example, the arch wizard can be used to create fans. The Mega Tree wizard can be used to create pinwheels.
In S3, Drawing Wizards could only create string or CCD fixtures. In S4, all Drawing Wizards can now also create DM Pixel Universe fixtures:
- Pixel Trees
- Pixel Arches
- Pixel Matrices
S4 Improvement 4: Wizards can create DMX Pixel Fixtures
So now you’ve created a THING (a fixture or a prop), and now you want to somehow change it. Tool handles to the rescue! After you have selected a fixture or prop you’ll see a bunch of these things surround the item.

Tool Handles allow you to move, resize, skew and rotate fixtures and props
- Corners are used to resize
- Middle arrows are used to skew
- Center X is used to move
- Rotation is done with the handle to the right
For Single Bulb, Flood, CCD and Pixel Universe:
  Vertex Handles allow you to move bulb locations, or delete single bulbs/pixels
  Click Once: Delete Bulb/Pixel
  Click Hold & Drag: Move Bulb/Pixel

For strings
  Vertex Handles allow you to modify the path bulbs will take
  Click Once: Delete this point
  Click Hold & Drag: Move this point
  Click BETWEEN 2 points on the path: Split the path in two and insert a new point
Press ‘Play’ button in Visualizer to start simulation mode. Visualizer will listen for commands from the Sequence Editor or Show player and show you effects on screen in real time.
Ensure you have properly set up the communications
Don’t forget ‘Control Visualizer’ in SE!
New less intrusive ‘Force Visualizer to top’ functionality
Start a sequence playing from the Visualizer by using the ‘Start SE’ button in simulation
Stop a sequence from playing by pressing the ‘Stop SE’ button.
• Showtime Software (S4) is in the middle of a large change in how we send data to other programs in the suite and to the hardware
• S4 Visualizer actually receives data from 2 sources: The old method AND the Comm Listener
• Some stuff not working? Make sure Comm Listener is running
• Do yourself a favor: Load the LOR control panel whenever Windows starts
Over the past few years we and our users have come up with some best practices when it comes to using the Visualizer. All of these are discussed on the LOR User Community in a sticky

[Lanister GoT + Super Mario Mush = Dr. House]
59:00 to here... Start demo now....
Resources

- **Light-O-Rama Information**
  - **Website**: www.LightORama.com
  - **Hardware and Software Store**: Store.LightORama.com
  - **Sequence Store**: Sequences.LightORama.com
  - **Tutorial Videos**: www.lightorama.com/S3TutorialLinks.html

- **User Communities**
  - Forums.LightORama.com

- **Even More Help**
  - LOR Partners: www.lightorama.com/PartnerNearMe.html
Questions and Answers
Thank you for being a part of the Christmas Expo family!