SERVING AND STORING MEDIA
For Internet Marketers

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This Is The Verbatim Video Transcription Of Our **MUA Webinar**

We're going to be talking about serving and storing media for internet marketers.

We're going to cover hosting, we're going to cover Amazon S3, we're going to talk about CloudFront, and how it affects your videos and other data. I think that this is an important presentation because a lot of people that set out to create an internet business, they skip over something very important and that is having a basic understanding of how the internet works, how your files are stored, and how they're served. Without getting too technical, it's very important to have an understanding of these things because this is where you're doing business.

It would be foolish to try to do business in an industry that you don't have a basic understanding of the technology and how it works. That doesn't mean that you have to know how an airplane actually works and how the engine of an airplane works in order to fly on a plane or even to be a pilot of that plane. But you do have to understand the basics about it. That's what we're going to do here. We're going to cover the basics.

This is kind of geared towards internet marketers. That's what I am, that's the type of business that I run is an internet marketing business. I'm going to be talking about serving and storing media. I'm going to talk about hosting. I'm going to talk about the way the internet works for internet marketers not for IT experts. If you're an IT expert and you judge my performance on this based on those standards, you're going to be very let down. But if you're an internet marketer, we're going to go from the very basics to a very advance understanding of hosting and serving media in a very short period of time here. Buckle your seatbelt, here we go.

First and foremost, there's a lot of places that you can store and serve data; some of them are more efficient at it than others. There's all kind of files from text files to images and things like that. The media files I'm referring to, HD images, audio files, and videos primarily. They tend to be very resource heavy. They take up a lot of space, they're memory hogs, and they also take up bandwidth. I think that's one of the first distinctions we're going to make in one of my first slides here is the difference between space, memory, and bandwidth. I think a lot don't understand that very basic concept from their hosting company. You're also going to learn that myth of unlimited hosting. No, there is a limit to your hosting I assure you. As soon as you reach it, you'll find out. Don't ever believe those myths about your hosting company trying to sell you unlimited hosting.

Many people store and serve their media from alternative locations and not their actual host, not the company that does their hosting. You might be wondering, "What the heck are you talking about? You mean you put your file somewhere else? Not at your host? Why would you

do that?" We're going to learn exactly why on this webinar. I'm going to show you exactly the different types of host, different types of servers, and why sometimes it's very beneficial for you to store your media in particular because it's such a memory hog, why it's a good idea to store it somewhere else.

We're about to cover some of the very basic web concepts that might seem trivial to some of you but they have to be clearly understood by everyone that's watching this so that we can move over to the advanced stuff. This is not an and-all-be-all IT training but rather the nuts and bolts tutorial that's geared for online marketers. I wanted to make sure that I preface that. Let's go.

Understanding the internet acronyms—all those letters that you avoid and skip over when you're reading post and things. Let's attack a few of the very important ones here today. We're going to start with this very basic question, what is the web? The web or the internet is how we refer to the series of interconnected computers around the planet that allow us to communicate with one another. The web is a bunch of computers connected together. When I'm talking about computers, I'm not talking about the one you're sitting in front of right now. "Oh yeah, internet is everybody's computer." No. The internet is all of the computers that are always on. They're always on turned and they're data centers all over the planet.

Those are the computers that are called servers that are interconnected and they're always on. Those are the ones that communicating. When you login to your computer to the internet, your computer is connecting to one of those computers to get data or to a bunch of those computers to get data. We're going to talk about that now that happens. The web itself, the internet, is how we refer to those interconnected servers or computers that are all over the world.

First acronym I'm going to hit you with, ISP, an important one to understand. Internet Service Provider. What is an Internet Service Provider? We already understand what an internet is. It's a bunch of computers that are connected together and they're all over the world. How do I dial into it? How do I access all this information that's on all these interconnected computers out there? ISPs are companies like AT&T, Verizon, Comcast, BrightHouse, you might be using a different one depending on where on the planet you're connecting. These are the type of companies that provide internet access to companies, families, and even mobile users.

ISPs use fiber-optics, satellite, copper wire, and other forms to provide internet access to its customers. You may have a cable modem in your house that literally, there's a cable that connects to your house, that's connected to a pole outside, that connects to data center, that connects to all of those computers on the web. That may be an actual hardline-type access.

You might have a satellite internet where you have like one little satellite thing attached to the side of your house. There's a lot of different types of modalities that these ISPs use. ISPs usually charge you a fee to connect to their network which is connected to the world wide web—www.

Now, let's talk about a browser. You can have one of any number of browsers. A browser is an application that you use to access and view websites on your computer. Common web browsers are, for example, Microsoft, Internet Explorer—they don't even call it that anymore. It's called Microsoft Edge and who the hell knows what they're going to call it next year. There's like a different version of that thing that comes out all the time. Google Chrome, that's probably the most popular one at the time that I made this content. Firefox by Mozilla. Safari is another one. The primary function of a web browser is to render HTML. I'm going to talk about that. I'm going to define that in a little bit here, but HTML is the code that is used to design or to markup web pages. It actually stands for Hypertext Markup Language.

Let's focus on this one because this is the first one, the first bullet that I actually started to get a little technical and complicated. Let's breakdown what I've been explaining. The web, a bunch of powerful computers connected together in these data centers all over the world. The ISP, the service that I use to connect my little home PC that I bought at Walmart—my little computer here in my house—I use a service by AT&T, Verizon, Comcast, and some other company that I pay monthly to connect my computer to those big powerful computers that are connected to all the other computers around the world.

On my computer at home, the little one I bought at Walmart, I can install a piece of software that's called a browser. The browser like Chrome, Internet Explorer, or Microsoft Edge, it comes built-in to the computers. Safari comes built-in to the MACs. Google Chrome is one that you download from Google. Firefox is the one that you download from Mozilla. Basically, they are programs that allow you to search the things and find things on the internet. The primary function is they take the information, the code, that's on those servers that you're accessing through your ISP, and they render it into a pretty picture that you look at and call a web page or a website. The browser takes the data and it puts in into that pretty little picture that you can read, and marvel at, and look at, and surf. That's what a browser does.

Let's talk about HTML. What is HTML? I hinted at it a minute ago, Hypertext Markup Language. This is the code that the internet is written in primarily. There's other code. HTML together with CSS, for example, that's another name for another set of code. It stands for Cascading Style Sheets. This combined with HTML is how most web pages display. When you're connecting to the internet using your browser through your ISP and connecting to the data centers on the worldwide web, you're fetching code called HTML, Hypertext Markup

Language, that together with CSS, your browser interprets to display that beautiful pretty website that you see. That's how most website's display. I'm not going to say most because there are other methods and I don't want you to think that this is the and-all-be-all explanation.

Speaking of which, let's talk about PHP. What is PHP? Another acronym that stands for yet another language; this is Hypertext Preprocessor. I don't know how they got the PHP from an HPP but that's what it stands for, Hypertext Preprocessor. This is an open source, server-side, scripting language that's used for the development of web applications.

As an internet marketer, doing business on the internet, these are terms that you should know, that you should be familiar with. You don't necessarily need to know how to code PHP or how to make HTML, create websites, and things like that. You should know that that is how it happened. You should understand that PHP is a scripting language that programmers use to develop web applications and together with another type of language or application called MySQL which stands for Structured Query Language that actually runs a databases on servers. PHP creates apps, SQL controls databases, and those things combined are used by programmers to develop web-based software applications which we often, as internet marketers, refer to as SaaS or Software as a Service.

Predominantly, what we do online in general, as internet marketers, deals with these specific codes or types of codes and language. HTML, CSS, PHP, MySQL, there are others. There's jQuery, there's AJAX, other things like that. Unless you're getting into software development, you don't necessarily need to understand exactly what those do, but these are the basics to have a conversation with someone about a server-based website, server-based software, or application online. It's good that you understand these things and you understand this specific order—the web, how the web works, an ISP, what an ISP is, and how one connects to a web and a browser, how you can fetch these type of code, HTML, PHP, CSS, MySQL, all that stuff that programmers put together onto your computer by use of a browser.

Now you understand the acronyms and we've kind of got the process basically sorted out here. Let's dive in a little bit deeper. Let's understand now the hosting and storage of these code, of this information, and these media and stuff that we're getting to.

What is a server? A server is a computer. It's a powerful computer but it is a computer. It is a computer with the basic fundamental just like the one that you have right now that you're watching this through, that you have at home. It's just a much more powerful one. That computer does not necessarily have to have a monitor screen, it might be in a rack somewhere. The shell of the computer might look a little bit differently than what you buy commercially. It's a powerful computer that stores files and information. It can be accessed by

other computers. Servers are always on; they don't get powered down. Not very often anyway not unless there's some kind of maintenance or something happening on it. Servers can process commands and run programs like a regular computer can.

This is important. It's important that you understand that a server can process commands and run programs like a regular computer can because it is just a computer. We can connect to servers remotely. If I, for example, am storing files or websites or things on a server, I can connect to that server and control it. Just like right now, you may be storing files, photographs, videos, and things on your machine, on your computer which is sitting under your desk, you can connect to it using your keyboard and your screen. You can go to the file, open it, and make that image appear on your monitor. But that image itself, the data that made that image happened, that's down beneath your desk in that computer, on that hard drive.

Imagine if that data was on a hard drive, on a computer far away. You can still access and connect to it. The way that you do it remotely for a server is through a process called FTP. It's called File Transfer Protocol. We used programs like FileZilla and things like that to be able to connect to our server and to be able to access the data. When you're working in the server level, you're going to be accessing it through a different software and using an FTP, something like a FileZilla. You're not using a regular browser. If I have data on a server, I want to access that data directly, and I want to work on the information, the code, and things like that, I'm not necessarily using a browser to do that. I'm using another program that applies a system called a File Transfer Protocol, FTP.

What is the difference between a memory and bandwidth? These is one where a lot of people don't understand this distinction. A lot of people call bandwidth a memory is like a way to refer, it just gets confusing. I just want to separate memory or storage with bandwidth. They're two different things. I just want you to make that distinction. Memory and storage versus bandwidth. Memory is where you actually store the data. Bandwidth means the amount of data that can be sent from one point to another in a certain period of time. I'm going to say that again. Follow the way that I'm explaining this. Memory is where you store the data. Think of it as like a little microchip that has information on it—your photographs, your text, your code, your whatever—it's on that little microchip. That's where the data is. That's the memory part.

Now, the bandwidth is the amount of that data that you can send from one point to another on a certain period. You can't take all of it out and move it all at the exact moment in time. It's got to go in pieces, little by little. If there's a giant jigsaw puzzle stored in that little chip, it's going to go one puzzle piece at a time to another period. The amount of puzzle pieces that can be sent

at a time are what we call bandwidth. Bandwidth means the amount of data that can be sent from one point to another in a certain period of time.

To give you an example, let's use plumbing. It's like saying the width of a pipe, the diameter—the internal diameter of a pipe, the gauge of the pipe—versus the amount of water in the tank. I might have a 100-gallon tank but if I'm using a four-inch pipe and I'm going a distance of a hundred feet, the amount of water that can transferred over the amount of time that it can go is called bandwidth. If we use a wider pipe, more water can pass through. The amount of time that it takes that it takes to get that 100 gallons to the other side is going to be less because more water can pass through. The width of that pipe is what we call bandwidth.

They're two completely different things. Bandwidth and memory. The size of the tank and the size of the pipe. Two completely different things. The bigger they both are, the more powerful your computer is. Sometimes you have a whole bunch of memory but very little bandwidth. The amount of time it takes to access that memory is longer. I'm not even talking about processor speed and stuff like that, no. That's a whole other conversation. I'm just going over bandwidth memory because it pertains a little bit more to hosting. I'm not saying that processor speed doesn't because servers obviously has processor's speed and things like that. What I want to talk about here is a distinction between bandwidth and memory as it applies to hosting.

With that, I want to talk about a data center because when we're connecting to that server, we're actually connecting to a room of servers. A data center is a large group of network computer servers that are actually together, maybe you've seen a picture or a photograph of a rack in a server room that has all these machines. Those machines that are screwed or bolted into that rack, they're computers. They just don't have a screen, an individual monitor for each one but they're computers. Instead of a computer sitting vertically on the floor underneath your desk, it's sitting horizontally and bolted into a rack in a big room at a data center. These computer servers are typically used by big organizations for remote storage, or processing, or for the distribution of large amount of data.

These is important to know because when you are putting stuff on the internet, when you're uploading something, that file that you're uploading is actually going and being stored on a little chip somewhere in some data center on a machine called a server that's in a rack, that doesn't necessarily have to have a monitor, that can be connected to, and accessed, and controlled remotely through a system called FTP. You're accessing it, viewing it on your computer through your browser which is connecting to the web through an ISP. Understand? You're getting the picture of this? This is important to know. These things are important to know.

Shared hosting is when many clients occupy partitions of a server and dedicated is when only one client uses the entire server. Now, you understand what a data center is. You can picture a rack with bunch of machines in it. These are powerful computers. They each can store memory. You can access this machine through FTP. The speed at which you can do that is called bandwidth. You can actually connect to it through using a browser. You got all these. You're following, right?

Now, you can understand that if you're the person or the company that owns the data center and you make money by renting space on these machines, those spaces are called partitions. When a whole bunch of people are sharing partitions on a machine, on a server, that's what we called shared hosting. You're occupying one little sliver or one part, of that computer, of that machine. Certain parameters, they actually control and govern everybody that's on that machine.

It's important that you understand that when you're sharing a computer with other people, you are also sharing that computers resources—that computer's speed, that computer's memory, and that computer's bandwidth. You are actually using it in collaboration with those other users. There is software that the data centers uses on those machines that is supposed to properly and evenly distribute those resources amongst those clients and those respective partitions.

We're not going to talk about, it gets a little bit more advanced. But the difference between that and dedicated hosting is that on a dedicated machine, it's dedicated just to you. You're the only person that uses that machine. All of its resources are yours. You can access core things on that machine and control core functionalities of that machine. You can run certain types of software without affecting anyone else.

We already know what PHP is. It's an open source language that program's very well. There are different versions of PHP. Just like anything else, it advances. There are different versions of PHP. There's PHP 4, PHP 5. It has to be installed in the computer for the computer to be able to run those PHP programs; those PHP scripts. If you are running something on a shared computer and somebody sets the PHP level of that machine to something older, maybe one of your particular things on your website doesn't run right. These are the compromises.

Again, that's not a very good example. These are the compromises that come with shared hosting is that everybody is using the same resources. The hosting company tries to keep those resources very generic, very general. There are limitations to what you can and cannot do on that. But on your own servers, since you're the only one on, you can do whatever you

want. You can install whatever you want. Generally speaking, you can do a lot more with a dedicated machine than you can on a shared machine.

Now, this gets really good. What is a CDN? We understand now what a data center is. There's a whole bunch of computers linked together. We understand that when we're sharing partitions and parts of those computers. We understand what a dedicated is. What exactly is a CDN? This is important for you to understand because we use them all the time, but we don't really understand what they are. Content Delivery Network is a system of distributed servers. A network all over the place.

Imagine, instead of all those computers in one rack, imagine those computers being in racks all over the place instead of one computer on top being connected to one right beneath it and one right beneath that. Imagine them being all over the planet. A specific network of interconnected distributed servers that deliver pages and web content to a user based on the geographic location of the user. The origin of the web page and the content is actually dependent on the geographical location of the person trying to access it.

Here's what this means. Let's say that you have hosting, but your data center is in Atlanta. In Atlanta, Georgia. That's where the data center is that's storing the pictures and the information that makes your website. Someone from Australia, someone from Tasmania wants to access that information. Well, they have to do that by connecting to their ISP through a web browser from their home in Tasmania and that web browser has to connect using all the languages that we talked about the internet connect to the data center. That data center that's closes them has to connect to your data center where the information is hosted and pull that information. It has to get fed from Atlanta all the way to Tasmania.

It appears to you that this is happening in a split second and it's kind of is. But there are these things that happen in advance to give you a user experience that appears in an instant. Those instances are called buffers and caches. What happens is your browser starts pulling information that you may click on, may use, and may need during your visit here. It starts pulling that ahead of time and storing it in your browser just in case you start clicking on that. This is called caching and buffering. If all of a sudden you clicked to play that video and that video has to be served from a server that's 15,000 miles away. We've only pulled this amount of data to get you up to the first 10 seconds of video and it takes longer to get the next 10 seconds of video than 10 seconds. When you reach 10 seconds, your video is going to stop playing and it's going to buffer. It's going to wait for the next amount of information or the next packet of information.

What happens is your browser is trying to give you a seamless experience during the playing of this media. However, because of the distance and the amount of information that's trying to pass, the bandwidth sometimes just can't do it fast enough for real time. This is when CDNs become important. What a CDN does is it takes way in advance; it takes that content that's being stored in Atlanta and it stores it at strategic data centers all over the world. It might store in a data center that's part of its network in Australia.

Now, when that person from Tasmania connects to your website since your website is hosting that data on a CDN, that data can be served from the nearest geographical data center to that person instead of having to being served all the way from Atlanta. That person can, in fact, have a seamless experience because the packets of information that are being served to their computer to the entire process that we've discussed here are going to their browser are coming from a much geographically closer distance. That is what a CDN does, a Content Delivery Network. That is what empowers and enables us to do. This is what the Cloud does. The Cloud is just a very fancy name for that. As a matter of fact, sometimes it's called the Cloud Distribution Network.

Now, that we understand what a CDN is, let's talk about alternative media hosts. There are services that are dedicated solely to storing and serving media. The reason that, specifically for media because I mentioned earlier, media are the things that really hog up the most amount of memory. If you think about a video, a video has frames. Generally speaking, there are a lot of different types of settings and codes—I'm not going to get into the technology behind it—but you just need to know for internet marketing, generally speaking, 30 frames in a second. What that means is 30 pictures, 30 frames in a second.

Imagine if you're just thumbing through a notebook and every single one of those pages have a different picture in it, that's how things get animated. Well, there are 30 pictures every second. Each one of those pictures, depending on the resolution, depending on the formatting, depending on the quality—is it high definition—has a certain amount of data, information, that makes each one of those pictures. Think about every millisecond, a certain amount of data has to be served, has to be passed from the data center computer to your computer. The bigger the video, the more the data. The higher the resolution, the more the data. The more the pixels, the more the information has to get passed. These are memory hogs and bandwidth hogs.

What I want you to do for a moment, just take the information that you've learned so far in this presentation and consider this. Consider that you are hosting your website on a shared hosting platform. You are basically occupying one partition of this powerful computer that a whole bunch of other people are using at the same time, a whole bunch of clients are using. On that

computer, you have your video which is an HD video. That video is in that little partition of that computer in Atlanta. Someone in Tasmania clicks the play button on that video which is being served through their browser on their computer. One packet at a time is coming from Atlanta to them all the way to Tasmania. It's coming from your computer.

Now, because obviously more than one person connect to your website, imagine if 100 people are doing this at the same time. You're on one computer. You're on a partition of one computer in Atlanta. Imagine if you open 100 videos right now at the same time on your computer, what would happen? If your computer tried playing 100 videos at the same time. You get my drift? You see what's happening here? The way that the computer would try to play those videos is one at a time. It would try to send a packet of information here, packet here, packet here. Eventually, the resources of that computer would reach its limit. Imagine 100 people trying to play that video from your partition while 100 other clients are also using that computer, are also showing videos from that computer to their visitors as well. You understand how things can slow down. This is why we use dedicated computers, dedicated service, and we also use alternative media hosts. The example that I just gave you is little bit extreme, but it serves to really get the point across.

There are services dedicated solely to storing the data, serving the media. These services don't run scripts or programs. Think of them like an external hard drive, like a really external hard drive. Imagine if that computer that you had, that partition on that you are just renting that little bit of shared space on, imagine if you can call them and say, "Hey, listen. I know I'm sharing this space, but can you connect a separate hard drive just for me to that computer." That's what we're talking about here when you use alternative media host.

You can use a hard drive from Amazon to connect to your hosting company. Your host, that's the computer, that's the server that's running the scripts. That's the one that's running PHP, that's running SQL. That's the one that's rendering and serving the HTML and that contains the data for your websites, your pages, and your content. The media, the stuff that has to get served quickly because if not it'll buffer and it'll ruin the user experience, the stuff that just can't be served all at one shot like an HTML can, like a text can. That stuff, we use alternative media hosts for. Those media hosts don't run scripts like HTML, PHP, and things like that.

Essentially, when you think of alternative media hosts, think of them like an external hard drive that you connect to your computer but it's just really external like it's in another country. Think of it that way.

Dropbox. Dropbox is a type of service, that's an external, like an alternative media host. It's a little bit unique though because it got certain features that enables us to share things. Dropbox

is a type of service that allows you to share and store files in the Cloud, so to speak. It's just a freaking server somewhere. It's a CDN. It's a network of servers. It doesn't run scripts. It's in the Cloud. It allows you to share files and store media. You do that because it makes your local computer more efficient because you're using the memory of Dropbox and you're paying a fee for that.

There are other services though, much bigger and powerful ones. One of them, one that I use, one that confuses a lot of people is called Amazon Web Services, for short AWS. Amazon Web Services it offers a very big line of products. It's not just a media storage, hosting, CloudFront, and things that we're going talking about here. There's a lot of other things that it offers. A lot of other scripts—very, very widely used group of tools for developers.

AWS is a subsidiary of Amazon. The big book company, the book store, the online retail giant, Amazon, same company. AWS is their web services division. They provide on-demand cloud computing platforms to individuals, to companies, and governments on a metered pay-as-you-go basis. I'll tell you it's very, very affordable in comparison to what the commercial hosting companies charged you for the little partitions of webspace.

Let's talk about S3. S3 is the acronym that they give to Simple Storage Solutions. Get it? SSS, S3. Amazon S3. AWS, S3, this is one of the things that I talk about with vernacular in internet marketing. When we're talking to about somebody who says, "Hey, you got your Amazon S3 account?" "You mean my AWS?" "Yeah, you mean Simple Storage Solutions?" It's just the same thing. Amazon S3 stands for Amazon Web Services Simple Storage Solutions—Amazon S3.

It's designed specifically for large capacity, low-cost file storage in one specific geographical region. The storage and the bandwidth costs are quite low. These are basically just very powerful hard drive to store all your data. But they store it in one geographical area just like that data center in Atlanta. Cool thing about Amazon S3 is you could pick the geographical region and they have a lot of them. You create what's called buckets in Amazon. I hope I can actually give you an example of this in a minute here. You can actually say to Amazon as you're creating that bucket or that storage container for your data, "I want this bucket to be in London." Or, "I want it to be in Australia." Or, "I want it to be in New Zealand." Or, "I want it to be in California." They have all of these. Generally, you're basically picking the data center that you want that bucket to be in.

You're basically getting a ton of storage and very low-cost storage. I'm talking pennies for terabyte. It's very cost effective for media especially for media that you're going to be

streaming to a lot of people at the same time. Your hosting company that charges you for bandwidth and you can actually run out of bandwidth.

Let me tell you something, you will run out of bandwidth and when you run out of bandwidth, because remember, that server if you're sharing, especially if you're sharing that computer with other people, the moment you're using up too much of the bandwidth, they don't want you to take up so much of that computer resources. You're going to screw up other clients' websites and make them go down so they're going to shut yours down. You'll try to access your site and it says, "Site limit reached. Contact your hosting company." When you contact your hosting company, they're going to want you to pay higher fee for more resources. This is what you avoid when you store the file, the big media hogs, and bandwidth hogs on service like Amazon S3.

Amazon S3 is not designed to run scripts, to run programs. People aren't going directly to the logging in to that Amazon machine and viewing your video there. They're viewing it on their browser, to their machine. They're just streaming the file, the file is what's located in Amazon S3, in that bucket, in that location you designated when you created it. Your website, and maybe your video player and all that other stuff is still being served from your hosting.

This is how we did it. Think of it like a computer and an external hard drive kind of thing and you being able to pick where exactly you want that hard drive to be on the planet so that people that you're trying to serve your media to don't have to wait a long time for it. There's a less chance for it buffering. That's the cool thing about Amazon S3. It tends to be very fast.

With that said, let's introduce now the concept of Amazon CloudFront because it's different. Amazon S3 simple storage solution allows you to store large capacity storage solution. It's the actual memory, the bucket. CloudFront, that's the delivering network. That's the pipe. That's basically the way that Amazon proxies and caches web data all over the world. They're called edge locations. They're specifically and strategically placed along the planet to be as close to users as possible.

I actually have an image to illustrate this, but I want you to try to picture this first before I show you the image. You got your data center, maybe you've got your website being served from the data center in Atlanta. The files are in your Amazon bucket that you put in the East Coast of United Stated or maybe for whatever reason you pick the West Coast in the United States. People that are going to your website, to your URL, that URL and that page that their browsers are rendering for them to see, that data is being pulled partially from your host in Atlanta and partially from your Amazon S3 bucket which is in the West Coast somewhere in California, in

San Francisco, whatever. That data is pulled together very very quickly and it assembles their websites. You save storages. It's actually beneficial for everybody.

But now, what if you've got somebody in Tasmania that wants to watch that video? You still have that issue. They're still pulling it from California but they're in Tasmania. Well, adding CloudFront to that Amazon S3 URL, adding the CloudFront feature to that Amazon S3 location, that bucket, what that does is way in advance, it creates mirrors. It creates proxies. It creates copies of that data and it puts it on other machines that are called edge locations on continents—in different places along the world.

When someone starts to access your website, they're accessing it from something called an IP address. We didn't get into that detail, but your web browser basically tells the data centers, "Where are you coming from?" "Where are you connecting from?" Based on an IP address. Think of it as latitude and longitude. They know where you are.

CloudFront automatically looks into this information and says, "Okay. Well, the closest edge location for the data you're trying to access is right here in Australia so let's stream the video for you from here." While somebody else is watching that same exact video on that same exact website but theirs is being streamed from London. Someone else is in California and theirs is being streamed from San Francisco. Someone else is on East Coast and they're on the same website. The website itself is being hosted and served from Atlanta, but depending on where you are, the video you're watching, that file is being served, those packets of information are coming from the closest possible location to you. That's what Amazon CloudFront does.

When you're putting all of these tools together, you can create a very fast, streamlined user experience for your visitor.

Here's an example of what I mean. This is not my image. This is an image provided by Cloudcraft. This image displays somebody connecting to your data. Imagine that you've got information in an S3 bucket and that bucket is located in the United States. A United States user and a European user are both connecting to that same bucket to access that data. It's still in that same location. Even though you can store massive amounts of data for low amount of money and it's not going to interfere other people's information and data, it's not going to interfere with your shared information in that Atlanta server, you're still connecting to that one bucket that's in California. The European experience is going to be slower and maybe a little bit harder to connect than the US user.

If you look at the top part of the image where we have another S3 bucket—imagine this is the same exact bucket in the United States, in the East coast—CloudFront is engaged on this bucket. CloudFront creates an edge location in the United States. It also got an edge location in the European continent somewhere. When the European user logs in and tries to access your website, that data is getting served to them from that location. But the United States users, their data is getting sent to them on that website. It's the same website. They're going to the same exact website. The website itself is rendering from Atlanta regardless of where you are but that data is quick to serve. As a matter of fact, some of that data is being cached on the user's computer if they've already visited your site and they've allowed cookies and things like that. Again, another topic of another conversation. Right now, we're just talking about the streaming of the media—videos, audios, downloading of files like images, pdfs, and things like that.

If you're connected to CloudFront, these edge locations are where your users are connecting to for the data. This all happens behind the scenes as long as you set it up. When I finish this presentation, I'm actually going to login to my Amazon S3 and we're going to actually explain and show you how to set that up.

Playing the media files themselves. Storing a media file and playing or streaming that media are two totally different things. We talked a little bit about this when we covered memory versus bandwidth. Storage and streaming are two totally different things. Keep that in mind as we go over the bullets on this slide.

Some companies combine these services. This is where it confuses internet marketers and online business owners. They get confused a little bit when it's like, "Hold on a second. I've got a video player. But wait, they host the video. They host the file." You get a little bit confused because you don't have a fundamental understanding of how the web works, how files are stored and transferred across the web, how your website is served, and how your media is streamed. When you're offered products like EVS, or YouTube, or all these other video players out there like Vimeo or whatever, you get confused with what's happening, and "What do I store? Where's my video coming from? Where do I upload my file? What's going on?"

Some companies combine the service of storage with the service of streaming and deploying. Some just include it in their service so it can be confusing if you don't understand how the web and how data storage works. Now, you've got a pretty good understanding if you've been following along of what shared hosting is, what dedicated hosting is, what Amazon Web Services does in storing large amounts of media, what CloudFront does, and what a CDN (Content Distribution Network) is. Now you have a much better understanding of this.

Video files like MP4 require a player. This is code. A player is code. It's an app that creates a viewable playback of the file on a device. A player is an app. It's software. It's running. It's an application that is operating. This application takes that file, those packets of data, those puzzle pieces, and it displays it. That's what a player does. This is code that creates a viewable playback of that MP4 file on a device. Where that MP4 file is coming from is irrelevant to the player. It doesn't matter if it's coming from Atlanta, from Zimbabwe, from Tasmania, it doesn't matter. The player don't care, the player just needs the file. Once it has the location of the file, it's just, "Okay, give me the packets. Give me the information. Let's go. Somebody hit play. Let's go. Give me the data." As fast as you can provide the data, the player's going to do it. "30 frame a second. Next second is here, do I have my next 30 frames? Wait, still waiting to get here from Atlanta."

The player and its functions are completely independent of the file, it's location, where it's being stored, whether it's in the CDN network or not. This is important for you to understand. Understanding this and combining it with the knowledge that some companies offer a player that also stores data. For you to understand that player and that data storage—two completely different things—where it's being stored, and how it's being served, is going to depend on whether there's buffering on certain parts of the planet. Certain people are watching your video and it looked seamless. Other people are stopping and going every three seconds. These players that we're talking, these codes or scripts as they're called, they're inventively called video players because that's what they do. They just play the video. It's a code that a programmer wrote to identify video information packets from a video file and to make it display the images on your screen.

Players can be fancy schmancy and have all kinds of things built into them. Video players have all kinds of features and fancy things, styles coded into them. Frames, control bars, fancy viewer sizes, mute buttons, and responsive. This player actually look this way on this browser. My player actually has an opt-in form that pops up on the middle of it. This player allows you to make still frames. This player allows you to play the video backwards. This player allows you three playback speeds. This one gives you volume controls. This one makes everybody look 20 pounds thinner. This one does this. This one does that.

The company and the maker of the player build all kinds of features into the player. This have absolutely nothing to do with the data or the video file itself that it's playing back. You can have a player that's manufactured by a specific company that's really good because it plays HD files. It's really good because it plays really well on any browser.

Regardless of how your visitor is connecting to your website, whether they're using Microsoft Edge, Microsoft Explorer 3.0, whether they're logged in from a Commodore 64 or they're

logged in from a new MacBook Pro, it doesn't matter. This player is so fancy and so technologically advanced that it looks immaculate on every device, on every browser. It doesn't matter if you're on Safari, using a PC, or if you're on Opera, using a Chromebook, or if you're on Commodore 64, using Firefox. It doesn't matter how you're connecting. Where you're connecting from has nothing to do with the player. You could be using the most awesome player and anybody on any device is going to be able to see this video properly because you're using the fanciest schmanciest player that you're paying a ton of money for.

If you're not using or serving that media from a location that's really close to that user, if you don't have enough memory and bandwidth available to you, and a lot of people are connecting at the same time, it doesn't matter what kind of player you have. The experience of that user is not going to be good. The data, the location, the storage, and the speed of data is messed up. All these things have to jive together. They have to go together really well.

There's a bunch of player companies out there. Vimeo, there's YouTube. YouTube is a free one. YouTube is a free video player. YouTube actually provides code that you can copy and put on your website. That is the player code. That is the code that creates the video player on your website. That's the script. The programmers at YouTube invented that. They made this code and now you can copy it and put it on. It plays in HD, it plays in 1080p, 720p, it's got this button, and because it's free it also has ads and it also has other things in it that might not be good for you to use on your website. Again, it is a player.

There are other players that are designed for commercial use. Vimeo, Wistia, EVS, they don't have ads. They don't have their own logo on there and try to get your viewer to click it and then take them to their own website. They're specifically made for commercial use and you pay a fee for that. They have special features that they give you. They have their own website where you could edit your videos.

For example, YouTube has, at the time that I recorded this, just released this thing called YouTube Studio. It's in beta. You can actually edit your videos inside of YouTube. You log into YouTube, upload your video, you can edit it in there. This thing is now a video editor, it's a video player, it's a video storage system, it's everything. YouTube is a service that offers all of these things.

You as an internet marketer, as an internet business owner, need to understand that these are individual pieces to a big puzzle. The player itself, you can get a player code, you get fancy schmancy player code from a company like Wistia which also has a CDN. I'm not sure if Wistia is the one; one of them connects to S3.

Some of these players have the player code and a whole bunch of cool features. When you log in, they ask that you enter your details for your Amazon account, your AWS account, and your CloudFront account. CloudFront actually gives you these keys, these codes, that you can use to connect to external players and external devices. They give you this key, you follow the instructions, copy this code, paste it in the player, and now the player will take the media that you're uploading. It'll put it in your Amazon bucket for you so you don't even have to login to Amazon and handles all that for you. It makes the process easier, smoother, simpler for you, as the owner of the website.

This is what some services like EVS do. EVS has its own interface. You log into it, you upload your video. The first time you log into EVS, you connect your Amazon, you connect your CloudFront, you set up your password, you set up your working environment. Now, whenever you upload your video—it's even got this little desktop app so you don't have to connect—you just drag and drop your video into the app and it's automatically going to put it on your Amazon. You can login to the website of EVS, you can edit your videos, you can setup your frames, your colors, all your stuff that you want. When it's all done, say, "Poop, here's your code. Paste this code on your website."

It has different types of code. Do you want responsive code? Do you want unresponsive code? Do you want code that's this size? Do you want code that's going to make this video this size? These things are important because in the modern age, people are logging into your website and accessing it through different devices. Some people are on an iPhone, some people are on an iPad, some people are on a desktop computer, some people are using Android, some people are using Apple, some people are on Microsoft, some people are on Mac. You're going to want code that's going to work well on all browsers and all devices. This is what the player does. The player does that for you.

The video file itself, it doesn't have to be an MP4. MP4 is the universally understood and used video file, but until not too long ago, there's all kinds of video files. Before this video, we're talking about FLV, SWF, AVI. There used to be so many. Some video players could only play this type of file or that type of file. Luckily, MP4 is like a universal type now that anyone can use.

Video players are completely different than the CDNs, storage networks, and the hosting. With that being said, it's worth noting here, HTML5 which at the time that I recorded this video, is relatively new. It's a couple of years old, like the talk of the town. The HTML code itself includes video player code.

Think about this. What this means is that most modern browsers, they don't even need a player anymore. If you just go to an MP4 file now, the browser itself plays it in the tab. If you have an MP4 link, you put that MP4 link right into your browser bar and you hit enter, the browser opens up the tab and starts playing the video.

The new, latest release of HTML—it's in version 5 right now at the time I recorded this—includes video player code. It's possible to do that now in a browser because it's universally understood that videos use MP4 file format. Before, I guess it was impossible to do this in HTML because there are so many different types of video file formats that the code would have to be too big to be able to understand how to play all of them.

HTML can play MP4 videos. Most modern browsers can actually just play your video right there. It has got default controls, by the way. It doesn't have all the fancy schmancy features if you do it this way. You might say, "Well, Omar, I have a WordPress website and WordPress has this little media button. If I upload my MP4 file and I clicked the media button, I can have a video on my website. Boom. That's it." Yeah, you're 100% right. You absolutely can but you're very limited as to the features of that video player because you're just using WordPress. WordPress is just using HTML5 which is what's built-in to the browser. It's also going to look a little different depending on what browser.

The thing to keep in mind as well is when you upload that video directly into your WordPress Media Library, you're uploading it directly to your host. You're streaming it from Atlanta. That person in Zimbabwe or in Tasmania that visits your website, even though it's really convenient for you to just drag and drop that video into your WordPress Library and stream it right from there using the default built-in media player that comes from WordPress—is all really simple—what you're doing is you're serving media from your computer, from your server. If you have 100 people trying to watch at the same time, you're going to reach the limitations of that server. That isn't going to happen if you're using Amazon S3, especially if you're using CloudFront. You've connected CloudFront to the bucket that you're serving that data from.

Continuing in the playing media files topic, some players—we talked about this a little bit—they actually host the files for you on their own like YouTube. YouTube, obviously owned by Google, have their own CDN network, one of the biggest on the planet. I think one of the biggest for storing media, videos, and images at the time is Facebook, believe it or not. Think of all the videos and images that Facebook and Instagram have to store and have to serve. Facebook itself has its own Content Distribution Network. YouTube has its own. Amazon has its own.

Think about it. Companies like Vimeo, Wistia, they have a service where they say, "Okay, well listen. You uploading your video to us, we're a commercial service, you can use our code on your website. You're paying us a fee for this. Depending on how much video storage and how much streaming you require, that fee goes up. But this is what you get."

By the way, a lot of cool features with Vimeo, as there are with other players. At the end of the video, for example, you consider, "Omar, why do I need it?" When you're using a service like Vimeo, you can tell the player, "When the viewer finishes watching the video, I want this to happen. I want to go back to the start screen. I want a form to appear." You can execute a command at the end of the video. You can't do that with YouTube. You can't do that with the HTML5 built-in player that comes with WordPress or the media player whatever they call it. You just can't.

These types of features are really cool. They also have social little icons and buttons. They activate the social sharing. Somebody can click the Facebook button on the video player and now it shares a video on Facebook. All these little things are built-in into the players. Wistia has some cool ones. Vimeo has some cool ones. There's dozens and dozens of players out there.

I'm using Vimeo right now. I still use EVS. I was a very big proponent and advocate for EVS for a while and I kind of went away from that because they just don't support it like they used to. I'm big on Vimeo now. I'm not opposed to YouTube like I used to be. The reason for that is YouTube tends to be the one that plays the best across all browsers on all devices. That just generally seems to be the case. Google and their team of computer scientists tend to stay on top of it. Some players actually host the files for you. They do that very well. Vimeo is one of them.

Due to the fact that browsers and devices are constantly updating, there's nothing you could do about this. This is a part of running a business on the internet that you're just going to have to live with. Devices are going to be updated. We're up to iPhone X now. I'm sure the 11 or whatever is going to come out. They just skip nine. I don't even think a nine came out. Devices are going to be constantly updating and with that is going to come new software and new requirements for videos to play and things like that. Due to the fact that browsers and devices are constantly updating and competing with one another, some video players don't work well on some browsers. This is very frustrating.

This is what happened with EVS. EVS stopped working for us on some browsers. It worked well on some if you were using certain browsers. It worked on some devices if you were on certain browsers. It just became this constant compromise. That compromise seemed to be a

lot less with YouTube when it came to visibility or viewability—if that's even a word—of your content or your material. The compromise with YouTube comes with their advertising. At the end screen, they want to put other videos. If somebody clicks on that YouTube logo, now they're on the YouTube website. They're going to end up spending the rest of the day watching cat videos instead of buying your products. As internet marketers, that's the compromise. If you use YouTube on your site, it's probably going to be visible on any device but you're going to lose traffic and quite possibly lose sales.

Due to the fact that browsers and devices are constantly updating with each other, some video players don't work well on some browsers. This is frustrating. It's frustrating as marketers. It usually involves some sort of compromise. I spent over three months last year, testing different types of video playback, players, and services. We tried just about everything from JW Player to our own customized player that we had on our servers. We tried EVS, obviously. We tried YouTube. We tried Vimeo. We tried Wistia. We tried a whole bunch of them. I decided to stick with Vimeo. I am still using YouTube and EVS but now we're all over the place. We're spread out.

It really comes down to you understanding what's out there, then knowing what your needs are, and then thinking of what is best for you when it comes to playing media files. What am I going to implore you to do is to think about not just what you need right now but what you're going to need as you grow. Choose an avenue that's going to be easy for you to grow with. If you choose a very dedicated video player, you might not be able to grow very well later.

The fact that we were using EVS meant that my video files themselves are stored on my own Amazon S3. That means that regardless of what happens with the EVS player itself and whether WebActix continues developing EVS or they just throw it to the curb and say, "That's it. We're not developing it anymore, guys. You're on your own," I still have all of my files, which by the way are in the thousands of video files now. It would be a monumental task, a task that I wouldn't even engage in if I have to move them all.

Luckily for me, when I chose my video player many years ago, I chose EVS. One of the reasons I chose EVS was because even though the player itself was being rendered by this company called WebActix and it was their code that I was using, the files were being stored in my Amazon S3 account.

Remember, storage and streaming are different things. There are a wide variety of methods and tools to do both. Some tools combine processes and systems while others are dedicated. This is what makes it difficult to have a conversation about. If you're talking to somebody about video and how they put video on their website, trying to figure out how you're going to put

video on your website, and you don't have an understanding of what's out there, of what a CDN is, of what dedicated hosting is, of what shared hosting is, of the different things that are involved in rendering a video, then you're going to have a hard time communicating and you're going to have a hard time understanding what's best for you.

The internet is constantly evolving. This is another thing. Don't get upset when something changes because this means that the ideal way to store and serve data today will change. It will change or it will become obsolete over time. You're doing business on an escalator that moves as you work in place. That's the internet. You're building your website and it's moving. You're on the escalator, you're building your site, this thing is moving, and it's changing location. It's important that you keep yourself abreast—I love that word—of technical trends if you're doing business online because the information in this presentation itself is going to change over time.

Again, this has just been a nuts and bolts, specifically, geared towards internet marketers and towards serving media, video in particular. I want you to understand the difference between what a dedicated server is, Amazon. I'm going to do a jump really quick before it closes. Normally, this is where I would end the presentation. I'm going to jump into my Amazon account now so you can actually see what this looks like.

I've just logged into my Amazon account. I'm actually inside of a bucket; I logged in directly into a bucket. I want to see if I can go to their homepage so you can see all the different services that they have. This is it. When you think of all the services, EC2, ECR, ECS, EKS, Lambda, Batch, all their storage services, S3, EFS, FSx, S3 Glacier, Storage Gateway, AWS Backup. Look at all these services that they offer. Amazon is huge and they've got all kinds of developer tools that they do. For our company, we use Simple Storage Solutions, which is S3, and we use CloudFront. I'm going to show you how we use them.

Recently, I created a bucket. These are literally my buckets. It's got a little picture of a bucket. When you create a bucket, you can actually choose where that bucket is going to be. I'm just going to create a bucket here for the purpose of this video here. I can enter name of the bucket. I'm going to call this omartrainingvideo bucket. I can select what region this bucket is going to be in. Remember I told you about that storage you can select where it is? It could be on the west side of the United States, California or Oregon. Ohio, on the east. In Europe, in Paris, in Ireland, in London. I can actually put this bucket anywhere in any of these locations.

I'm going to pick London for my bucket. I can copy settings from another bucket that I've created because there's lots of settings that you create when you make a bucket, but I'm not going to do all that. We're just going to push through all of these settings but there are a lot of

different things that you can set permissions, who can access the bucket, where they can access it. You can actually set a permission on the bucket where a person has to be logged into a particular site and they can't access it. You can set permissions on a bucket so the file is visible but the root of the bucket isn't so they can never see the entire directory.

There are all kinds of things that you can do with Amazon. I'm just going to go ahead and push all the way through the default to create the bucket. You'll see that that bucket will pop up. Since I come down here, here's all the different buckets that we have right now, and I can go find—it's alphabetical—omartraingvideo bucket.

Now, I can just drag and drop stuff in this bucket. I can upload information into this bucket—data. I can drag and drop an image or video or something like that. Right here, this is an MP3, this is the entrance music for my webinar. That's just my weekly webinar entrance music. I can drag and drop this right here. Now, it'll upload that to that bucket and I can set the permissions of who gets to access it. I'm just going to use all the defaults here. It's uploading that. Right here, you can see it going up and it's putting this right now in London. This is being uploaded right now to a data center in London and that's where that is right now.

Now, I can get this link and you might say, "Omar, what if somebody's accessing that and trying to play that from California. since it's in London?" Well, I can actually create a distribution for this, a CloudFront distribution. Now that's a little bit more technical. The way that we do that is we can add CloudFront to this bucket. We can go to AWS, the way that we went in the beginning. Click on CloudFront. These are the distributions that I already have set up. I can create a new distribution. Just click Get Started. I can click the Name of my distribution. Usually, what I do here is I put in the URL of the actual location of the file. What I would do here is I can find that bucket that I just made, omar training video, right there.

Now, there's a couple of other settings here that I'm just going to use all the defaults. You can watch a video that they have that teaches you how to do this. I think they do require one or two more things, but I think you just create that distribution like that. I could put a note in there and stuff. Now, I have that distribution and I didn't name it. I don't know which one it is. I shouldn't have done that. It's this last one that I did. Usually, I should've named it so I would know which one it is. Over here, it'll tell me by the location of it. This is the distribution, this one right here.

What happens is, I can take this link. This is actually creating that distribution. What it's doing right now is it's in the process of creating a CloudFront distribution for this bucket that I made. It's taking all the edge locations and the CloudFront CDN on the network. My understanding is it's creating an edge or a mirror for my files from that bucket on all those locations.

Eventually, what I'm going to be able to do is create links. I can actually take this URL and use this instead of the location that's just the regular Amazon S3 bucket location. If I go back to that bucket, this file, if I want the link to it, this is the Amazon S3 link to it. If I were to copy it right now, this is the location of the file in London. I didn't set permission for anybody to just be able to access that file. I got to go and create the permission for it to be accessible.

As you know, you watched me do it. I just went and defaulted all the way through those settings. I didn't set that. If I took some more care, I can make it public. It's being served right here by S3. What would happen now is that when my CloudFront distribution is complete, I'll be able to go and grab my distribution URL for that.

I would go back to CloudFront. Let me see if that distribution is done. It's not. It usually takes a while to propagate because it's putting it in all kinds of places on the planet right now. What would happen is I would be using this URL, this prefix, that would go here instead of this. This would be the URL. Now, this file will be served from my… actually, that's not it. It would be CloudFront something. I'm copying it from a wrong place but you get the point.

Eventually, I would copy the URL. There's a place on here that you click, and you copy the URL for the distributions from that bucket. Now, it's being served by CloudFront instead of being served by Amazon S3.

Again, not something that I do all the time. I have a team of people that work for me that do this, that know how to do this much better than me. But I know enough about it to be able to talk about it, explain it, and even get in here, and play around with it. I know enough to break it, basically. The point that I want to come across to you is that there's all these different pieces to being able to stream media effectively. As you can see, we have a lot of buckets and we stream a lot of data from a lot of different places on the planet to make sure that it's being streamed for the closest possible location to the person that's actually trying to consume the data.

I have rushed through this part of it and I fumbled around here with the screen. It's just a little added perk that I wanted to give you so you can actually see what a CDN looks like, what Amazon S3, and what CloudFront's looks like when you're actually preparing a distribution, when you're actually creating a bucket. Normally, if I would be doing this for one of my websites, we're taking a lot more time. I would be reading each line and I wouldn't just be forwarding through it. I would be much better prepared. I just wanted to give you a little bit of a taste, a little bit of a picture of what this looks like. I want you to know that this is very cost-effective.

Melinda's sitting next to me right now and she is shaking her head. She is nodding. She is agreeing with me because our Amazon Bill is usually—can you jump in Mel and tell us what?

Melinda: It's under $40.

Omar: It's under $40. In hosting alone, we pay about $500 a month. We have three servers. Dedicated hosting is expensive. To serve all of our media, I'm talking thousands and thousands. You saw how many buckets I have. We have thousands and thousands of files. I'll go to just one of my buckets here. Let's go to one of our Amazon buckets. For example, here's my EVS videos bucket. I'm just going to click on that one. I want you to see how many videos are in this bucket. I'm scrolling here. Do you see how many files are just in this bucket? This is just viewing 1-300. This keeps going and it keeps going. From 301-600. It keeps going. This is one of my buckets. Mind you, I picked one that I know is large and has a lot of stuff already on it.

These other ones are not much different. They have a lot of data. We have a lot of data on our Amazon S3 account and we do that because we know that serving from here is a lot cheaper. Notice some of these buckets are public. It also tells you most of these are in the east. I have content that just for whatever reason is in Oregon. Most of these are on the east coast because I have CloudFront connected to the ones that need to be better serving to a lot of media to a lot of people all over the world.

I hope that this gave you a good insight into serving media through Amazon and serving media using a CDN. That you have a good understanding of hosting and how the internet works as a result.

To Your Success,