Video Compression:

Compression: - Compression is a reduction in size of data in order to save space or transmission time. For the data transmission compression can be performed on just the data contain or all the entire transmission unit depending on a number of factors.

OR

Video compression is the process of encoding a video file in such a way that it consumes less space than the original file and is easier to transmit over the network/ Internet.

It is a type of compression technique that reduces that size of video file formats by eliminating redundant and non-functional data format eh original video file.

Video compression is performed through a video codec that works on one or more compression algorithms. Usually video compression is done by removing repetitive images, sounds and/or scenes from a video. For example, a video may have the same background, image or sound played several times or the data displayed/attached with video file is not that important. Video compression will remove all such data to reduce the video file size.

Once a video is compressed, its original format is changed into a different format (depending on the codec used). The video player must support that video format or be integrated with the compressing codec to play the video file.

Data Compression:

Data compression is the process of modifying, encoding or converting the bits structure of data in such a way that it consumes less space on disk.

It enables reducing the storage size of one or more data instances or elements. Data compression is also known as source coding or bit-rate reduction.

Data compression enables sending a data object or file quickly over a network or the Internet and in optimizing physical storage resources.

Data compression has wide implementation in computing services and solutions, specifically data communications. Data compression works through several compressing techniques and software solutions that utilize data compression algorithms to reduce the data size.

A common data compression technique removes and replaces repetitive data elements and symbols to reduce the data size. Data compression for graphical data can be lossless compression or lossy compression, where the former saves all replaces but save all repetitive data and the latter deletes all repetitive data.

In term of computer the only limitation of multimedia presentation is that to consume a lot of storage space. In ordered to reduce the storage space the multimedia component. Must be

compressed. Compressing a file reference to the process of cutting down the shy of the file by using special compression technique. There are two type of Compression technique are used:

- **Lossy Compression**
- **Lossless Compression**

LAZY Coding:

Lazy loading is the practice of delaying load or initialization of resources or objects until they're actually needed to improve performance and save system resources. For example, if a web page has an image that the user has to scroll down to see, you can display a placeholder and lazy load the full image only when the user arrives to its location.
The benefits of LZY loading include:

- Reduces initial load time – Lazy loading a webpage reduces page weight, allowing for a quicker page load time.
- Bandwidth conservation- lazy loading conserves bandwidth by delivering content to users only if it's requested.
- System resource conversation- lazy loading conservation both server and client resources, because only some of the images, JavaScript and other code actually needs to be rendered or executed.

DCT Coding:

DCT Stands for *Discrete Cosine Transform.* A discrete consine transform expresses a finite sequence of data points in terms of a sum of cosine functions oscillating at different frequencies. The DCT, first purposed by Nasir Ahmed in 1972, is a widely used transformation technique in signal processing and data compression. It is used in most digital media, including digital images(such as JPED and HEIF, where small high-frequency, components can be discarded), digital video (such as MPEG and H26x), digital audio (such as Dolby Digital, MP3 and AAC), digital television (such as SDTV, HDTV and VOD), digital radio (such as AAC+ and DAB+), and speech coding (such as AAC-LD, Siren and Opus). digital television (such as SDTV, HDTV and VOD), digital radio (such as AAC+ and DAB+), and speech coding (such as AAC-LD, Siren and Opus). DCTs are also important to numerous other applications in science and engineering, such as digital signal processing, communications devices, reducing network bandwidth usage, and spectral methods for the numerical solution of partial differential equations.

The use of cosine rather than sine functions is critical for compression, since it turns out (as described below) that fewer consine functions are needed to approximate a typical signal, whereas for differential equations the cosines express a particular choice of boundary conditions.

Hypertext:

Hypertext is text which is not constrained to be linear.

Hypertext is text which contains links to other texts. The terms were coined by Ted Nelson around 1965.

Hypertext is text displayed on a computer display or other electronic devices with references (hyperlinks) to other text that the reader can immediately access. Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, keypress set or by touching the screen. Apart from text, the term "hypertext" is also sometimes used to describe tables, images, and other presentational content formats with integrated hyperlinks. Hypertext is one of the key underlying concepts of the World Wide Web, where Web pages are often written in the Hypertext Markup Language (HTML). As implemented on the Web, hypertext enables the easy-to-use publication of information over the Internet.

Hypertext can be used to support very complex and dynamic systems of linking and cross-referencing. The most famous implementation of hypertext is the World Wide Web, written in the final months of 1990 and released on the Internet in 1991.

Hyper Media:

Hyper Media is a term used for hypertext which is not constrained to be text: it can include graphics, video and sound, for example. Apparently, Ted Nelson was the first to use this term too.

Hypermedia is an extension to what is known as hypertext, or the ability to open new Web pages by clicking text links on a Web browser. Hypermedia extends upon this by allowing the user to click images, movies, graphics and other media apart from text to create a nonlinear network of information. The term was coined by Fred Nelson in 1965.

Hypermedia allows links to be embedded in multimedia elements like images and videos. You can tell if something is hypermedia by hovering the mouse cursor over the image or video - if the element is hypermedia, the cursor changes, usually into a small hand.

Although the Internet is the best example of the use of hypermedia, there is a lot of software that makes use of both hypermedia and hypertext. A lot of word processing, spreadsheet and presentation software like Microsoft Office allow hypermedia and hypertext to be embedded into the documents created. For example, in Microsoft Word, users can add hyperlinks to any word and even add links to pictures. Microsoft PowerPoint has the same feature for hypermedia.

Differences between Hypertext and Hyper Media:

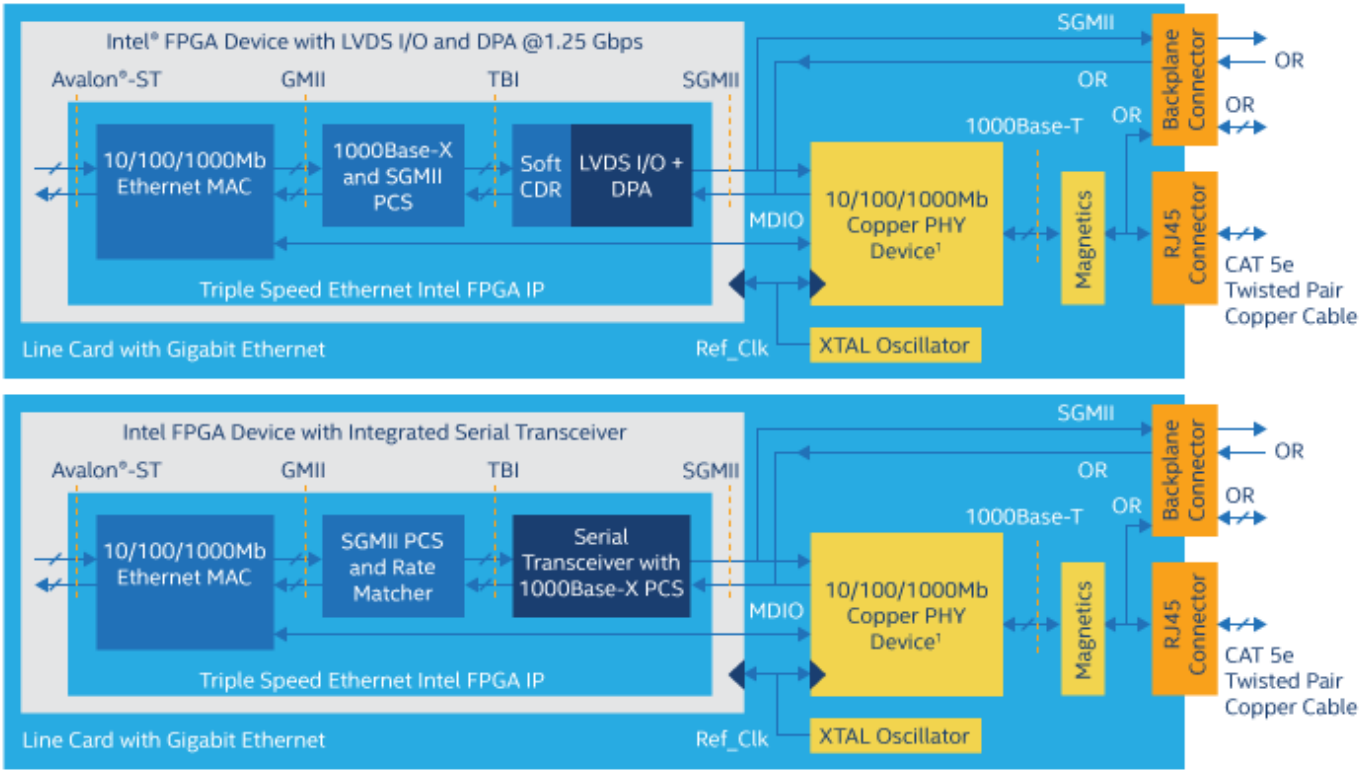
HYPERTEXT VERSUS HYPERMEDIA

Hypertext	Hypermedia
It refers to text which links to other chunks of text within same or different document.	It is an extension of hypertext which is not constrained to be text-based.
It is an interconnected network of documents linked together via strong cross referencing tools called hyperlinks.	It refers to a non-linear presentation of content that includes plain text, images, audio, video, and still or moving graphics.
It simply allows users to jump from one document to another by clicking on "go to" links.	It extends the ability of hypertext to include links within all sorts of multimedia objects.
Hypertext technology is based on effective human-computer interaction and relevant cross referencing of related items.	Hypermedia technology extends the use of multimedia elements to create clickable links that readers can both access and interact with.
It represents multimedia content in electronic text format.	It combines both hypertext and multimedia to represent a wealth of information.

SGMI:

SGMI Stands for *Serial Gigabit Media Independent Interface*. The LVDS I/O in the Intel® Stratix® 10, Intel Arria® 10, Stratix V, Stratix IV, Stratix III, Arria V, Arria II GX (fast speed grade), Intel Cyclone 10 GX and LP FPGAs allow you to easily implement the Serial Gigabit Media Independent Interface (SGMII) for 10/100/1000 Mb or Gigabit Ethernet. These devices have built-in serializer/deserializer (SERDES) circuitry that supports high-speed LVDS interfaces at data rates up to 1.4 Gbps. The SERDES circuitry is configured to support source synchronous and asynchronous serial data communication for the SGMII interface at 1.25 Gbps. This SGMII solution meets the SGMII specification and saves cost and power in systems that have low to high port-count Gigabit Ethernet per device.

The integrated gigabit serial transceivers in Intel Stratix 10, Intel Arria 10, Stratix V, Stratix IV, Stratix II GX, Arria series, Intel Cyclone 10 GX, Cyclone V GX, Cyclone V GT, and Cyclone IV GX also support the SGMII interface.



SGMI connectivity choices with an Intel FPGA and a PHY Device

Document Architecture:

Documenting architecture is an important part of software development. Architecture must be documented in a good amount of detail and should be presented in an accessible form for many different stakeholders. A simple search shows lots of material. However, much of it tends to be pretty complex in nature. Much like there is not one definition around what an architect does, there is not one standard precise way of documenting architecture. The goal of this post is to share some of the techniques that I have successfully used as easy-to-read material, as well as to solicit feedback.

Reasons to Document Architecture:

Let's Look at some of the reasons around why we need to document architecture.

- Whiteboard designs are not persistent!
- Teams grow in size, and explaining the principles of architecture to a wider and wider audience gets difficult.
- The various decisions that drive the design could be forgotten and documenting them could help us get some rationale.
- People don't say forever.
- Stakeholders have different concerns. This is a solid way to address those concerns ahead of time.