Technologies needed and used for E-Commerce

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# Hardware/Software

To get an E-Commerce website up and going, you need several important pieces of hardware and software. Without the following hardware/software, you wouldn’t be able to run an E-Commerce website and clients wouldn’t be able to browse it.

## Web Servers

Web servers are simply powerful, purpose built computers, these computers function much like any other computer would, however their sole purpose is to host web pages and other web related content for a company. A web server will commonly have a very large amount of throughput to handle a mass amount of incoming and outgoing information, this is where the purpose built part comes in, the web server is built with a greater than normal amount of possible throughput as-well as other hardware and software implementations to ensure it is able to do its job as easily and as good as possible which is to host your e-commerce website and all its components.

## Internet Browsers

Internet Browsers are again pieces of software, however unlike web server software which is commonly thought of as a server side piece of software, this instead is a client side piece of software. An Internet Browser is simply an application that allows you to access web pages over the internet in a fast and simplified manor. Users (clients) would use this software to access your e-commerce website via the internet. Web Browsers use a variety of protocols and ports, however it is mainly just HTTP, DNS and FTP.

## Server Software

Server software is the software that allows you to host web pages and other content on the internet to be accessed by others. By hosting it you are making it available to the rest of the world via the World Wide Web. Without this software, people would be unable to access the E-Commerce website you create. The most common web server software is Apache, Lighttpd and Ngnix HTTP Server. Web servers always use the HTTP Protocol and commonly run on port 80 as default.

## Web Authoring Tools

Web Authoring tools are those pieces of software that programmers and web developers use to create the web pages and web content that goes onto the web server and is hosted on the world wide web. In terms of E-Commerce, this software is what is used to create and edit the actual e-commerce website. Web authoring tools are normally purpose built to handle the specific programming or mark-up language (http/css/JavaScript). They also implement things that make it easier for web developers to create and edit web pages. Another term for this software is Web IDE’s or Web Integrated Development Environments.

## Database System(s)

Database systems are simply application that run on servers (normally the same server you are running the web server software from) that allow you to store a mass amount of information in a simple to understand and clear manor. This software is normally used to store things like product information such as codes, prices and other information. It can also be used to store customer information if that is needed for your e-commerce website. The most common database servers are MYSQL, Microsoft SQL Server and Oracle.

# Networking

Networking is a big part of E-Commerce as it’s needed for you to make your website and other content available to everyone else on the internet. In terms of e-commerce, this is mostly handled by the following things.

## TCP/IP Addresses

TCP/IP is the protocol that is responsible for giving servers and client machines IP’s and giving them the ability to talk to each other. TCP is the protocol that makes it possible for you to communicate between one computer and another and thus is the protocol that allows you to communicate with the web server and thus view the web pages that are hosted on that web server.

IP or Internet protocol is the protocol that is in charge of giving your machine and the server machine a unique identification which you are able to use to access it from anywhere in the world (this is known as the IP Address) The IP address is what your client internet browser uses to access and download web pages for you to view. Both this and TCP are the protocols that allow clients to access the E-Commerce website.

## Network Ports

Network Ports are used hand in hand with the TCP/IP protocol suite and are application-specific software constructs that allow multiple servers on your webserver such as a HTTP Server, a database server and an FTP server to all communicate at the same time. There are set default ports for a verity of protocols used on the internet that would be used in E-Commerce, these are normally the HTTP server default of port 80 and the ftp port default of 21 and 22. Ports have a range from 0 up to 65535 of which you can use however only one port can be used per application. Ports can however be repurposed if ever needed.

## Protocols

Protocols are the things that allow everything to function and communicate correctly. A protocol is normally an industry recognised and verified way in which you build an application and have it communicate. For example; All webserver applications may have different ways in which the files and security is handled when hosting them. However the overall basic way it communicates with client web browsers is the HTTP protocol, DNS and TCP/IP protocol. The reason we need protocols is so that all applications and computers able to communicate and understand the various requests and responses that are sent and received between them. A protocol can be thought of like a language that the computer speaks, if one computer speaks English and another speaks French, they’re unlikely to understand each other, however if we just agree that all communication is going to take place using English then there is never any problems. This is why protocols exist and are needed.

# Considerations

There are various things you have to consider when you are creating your e-commerce website. Mostly these things have to be considered because not everyone is going to be using the same software, hardware or even operating system. You also have to take into consideration the domain name you use for your website and if you’d to register more than one.

## Domain Name Registration

A domain name is how all clients will access you’re e-commerce website. A domain name is simply an address you use instead of the IP address of the server to access a website, domains names are converted by the DNS protocol into an IP that can be then used to access the webserver. For example the IP for <http://www.google.co.uk> is actually: 74.125.224.72 however remembering and type in that IP address all the time may get a little tiresome and thus puts people off using your website. Using a domain name makes it a lot easier to access your website and is also easier to remember, this means people will be more inclined to visit as it’s easier to remember for when they may wish to go to your e-commerce website. You normally register a domain through a domain registrar however in the past few years this process has become a lot simpler, today you can register a domain through many third party websites such as GoDaddy or OVH. Domain names are normally quite cheap to register, ranging from around £5 to £20 for a year’s registration. The best domain choice is something that is easy to remember, not too long and relates to your company in a way that makes sense, so when people are trying to remember the URL for your company website they’re easily able to relate it to your company. Having the domain Ilovecats.com when the company deals with computer repairs makes no sense as it is not relatable.

### Multiple Domain Name Registrations

Ina lot of cases it is also a good process to register multiple domain names that all relate to your main domain name. You would normally do this to help prevent things like people stealing your clients for their e-commerce or other website using your name and reputation. You would need to register multiple domains simply because of how many other domain extensions exist. For example if your domain was compreps.com, someone else would also be able to register compreps.co.uk and have it link to their website instead of yours. Another reason you may want to register more than one domain is for the fact that some people will simply forget if your website is .com or .co.uk.

For this reason above, it is always good practise to register multiple domains for your e-commerce website, the main ones you should always consider registering are the primary used domains such as: .com, .co.uk, .net, .org, .uk, and .eu. These are all primary domains that are used throughout the web and the ones that are going to be most used if people forget.

## Programming Requirements

When developing your e-commerce website you need to ensure you have planned out what you need on the website so you are able to correctly choose the best way in which to program it. Is something going to be client sided like JavaScript or is it going to server sided like ASP.NET. You have to take this into consideration for two main reasons, one is how fast your web page loads however the second more important issue is if what you want to do is even supported by JavaScript or will work correctly on the client machine. On a client machine you have far too many things that can be different, on a server you know exactly what is running and you know that your scripts will run correctly. The last reason could be for security reasons as it’s a lot harder to edit server side scripts as the client never sees them while client side scripts are downloaded onto the client machine and thus have the ability to be edited.

## Download Speeds

Download speeds are becoming less and less a problem with websites however there are places and people that have poor internet speeds or even bandwidth caps on their internet which may mean they’re unable to view your website or it takes too long to load so the client doesn’t even bother waiting or viewing your e-commerce website. The main thing you want to do before anything else on your e-commerce website is to draw people to it and make it easily accessible for as many people as you possibly can (just like you’d want to build a shop in a high traffic area). Having a website that takes forever to download and display on the client machine is going to be very annoying to the client and thus you’re pushing potential customers away. Making sure your website loads fast is an essential part of an e-commerce website and can be done in several ways. The first of which is something I have already mentioned which is to make all the scripts you can, server side to help cut down on the amount of things the clients machine has to handle and do. The second thing is the ensure the images used on your website are kept as small as possible without losing image clarity, this can be done by simply making the main images that are loaded quite small but clear enough to see (like looking at a product from further away in a shop) then having a larger image load when or if the client clicks on the product in question. Anything you can do to help cut down on the size of the website that is first loaded will make it download faster.

## Browser and Platform Compatibility

Browser and platform compatibility is a pain because no everyone uses the same web browsers and not everyone uses the same operating systems or devices. A classic example above all others is web pages that are not made to run on mobile phones. These web pages are often far too small to see correctly as the size of the screen is far too small while the resolution is still 1080p. Another problem is that not every browser has the same implementation of things like CSS and JavaScript as each other, this may make things display incorrectly and may cause bugs on your website. While not being able to view on mobile devices is an inconvenience to clients, it’s not a website breaking problem, however browser compatibility can cause website breaking problems which is a big problem on a website that is for selling products. Having a bit of JavaScript that doesn’t work just as you are about to check out which still takes money but doesn’t send the information to your database would be a massive problem as you have no record of the order while the client has been billed for it still. To combat this you have to ensure you have programming procedures in place to ensure your website works exactly the same across all devices. In a lot of cases this means gathering information from the client such as the web browser they’re using and operating system they’re running on and then providing webpage material and scripts that run correctly on that client’s device.

Impacts of introducing an Ecommerce System

As everything introducing an e-commerce website to your company comes with it’s up and downsides.

# Upsides

The Upsides of introducing and E-Commerce Website.

## Global Marketplace

E-commerce allows you to have a store that is essentially accessible from anywhere in the world providing the client has an internet connection. This expands your company reach to a global scale and multiplies the amount of possible clients you could have, especially for things like selling custom made computers.

## 24/7 Trading

You are able to do trading 24/7 because most e-commerce systems implement a database system that you can go through every day and complete the orders, you can still be trading during the time your shop is closed and you’re sleeping. This again increases the amount of possible customers that you could have, for example the people that are awake while you are asleep.

## Relatively low start-up

Compared to any other business venture, setting up and running your own small e-commerce website to sell custom computers and repairs is incredibly small. The only costs are really someone to create the e-commerce website or buying a template for you to use as-well as the domains and web server. This has a really small impact money wise on your company and is very easy to justify monitory wise.

## Low running costs

When the website is up and running the costs go down instead of up like is sometimes the case with physical shops. You already have the e-commerce website and the domains will be paid for (for 1 year+) so the only costs are those of the web server.

## Competitive Edge

You gain a competitive edge over other shops in your area or any other shop without an e-commerce website because of the amount of extra reach and access you are giving clients. This is going to make your company look a lot more enticing to possible clients when they’re trying to decide where to go as visiting a website is easier and faster than going to a physical shop.

## Search Facilities

You are able to offer clients search facilities so they’re able to find exactly what they want. This is an upside because of simply how easy it is for the client, many clients will hate looking through a shop for hours to find something specific so by providing search facilities you are able to make that process a lot easier and thus the client is more likely to use your company. You are also able to make the search facilities as defined as possible so for example you could create search functions based on what type of processor the clients wants in the custom P.C, how big the HDD needs to be and how much ram they desire and only provide products that fit that description. This is a lot easier for the client in terms of searching for something they want as they don’t have to mess around looking at everything and going through the specs of hundreds of products. Again this makes the client more likely to purchase from you as they’re able to find something that fits exactly what they’re looking for.

## Gathering Customer Information

With any e-commerce website, your primary form of purchase for the clients is going to be online orders, online payment and some form of delivery for the product. With this you are going to need to gather information from the clients such as payment and delivery information. This is a good point because by having that information just once you are able to use it again for the customer in the future (providing they give you permission to store said information). This would make the checkout and payment process on your website much faster for further purchases by the client and may make the client more likely to purchase from the website in the future. This also allows for things like one click services on products such as the one implemented by Amazon. You also have the ability to gather information on customer reviews which may help persuade other customers to buy products from you in the future as they have more faith in the product being good.

## Alternative Income Sources

Alternative income sources for an e-commerce site could be things like advertising. Advertising on an e-commerce site is very simple to implement and can generate extra income for your business without any extra charges.

## Pricing Differences

With e-commerce you also have the ability to setup different forms of selling and setting prices. One of the main things that a lot of ecommerce sites setup is a bidding type system. A bidding system works just like it would at an auction except you set it up online to be automated with min selling prices and let customers bid on products. This is a benefit because it allows you to still ensure that you get a minimum set price for the product but also allows you to get more than you normally would as people will try outbid each other on the product. This means you can possibly get more than what you normally would through conventional pricing.

## Fluid Pricing

By having an online ecommerce website you are able to change prices more frequently, this is good thing because it allows you to quickly change prices based on demand for the product, so when the product is in high demand or low demand, you can set the price of your products accordingly in a fast and easy manor.

# Downsides

The Downsides of introducing and E-Commerce Website.

## Customer Trust

Starting an ecommerce website can be a fast and very simple to get setup but once you have done so you have the problem of “how do I build customer trust” this is a problem because many people are still weary of buying online, having to post there credit card and personal information onto a website can be a scary process and many people simply won’t do it unless they can trust your website. Building trust on an ecommerce site can be a very hard process simply because there is very little customer interaction.

## Lack of Human Contact

The lack of human contact is a downside because many people like to ask questions and talk to someone who may be a little more knowledgeable of the product they’re interested in or may just have questions in general. There are a few things you can implement to help with this however human contact is something that you simply don’t have on many ecommerce websites.

## Delivery Issues

The main way in which items are given to the customer from an ecommerce website is via home delivery. This can become a problem because you have to then rely on the delivery company to deliver your products to the customer, when they fail to deliver or it goes to the wrong address you have to then either try sort it out by getting the item returned to your company at your own expense or in the worst case scenario you would have to resend the item to the customer which means you have lost out on money because you’ve had to send two items while only getting paid for one.

## International Legislation

International Legislation is a problem simply because by opening your business to trade from all over the world you are also opening it up to all the laws from those countries too. This can be a problem because one country may have a different law for an object or product than another. A simple example may be the legal drinking age in the UK compared to the USA, while this isn’t at all related to computers and a technology business, the principle is that same. Many countries have different laws regarding how certain materials have to be treated during import/export, so if you consider how many materials are used in the construction of computer components and technology devices you may find that some of those materials have to be inspected or treated a special way. You may also have problems shipping to other countries because of new laws imposed by said countries regarding inspection of unusual looking objects. To someone who doesn’t know you are shipping a computer, that package may look like a bomb or other malicious device.

## Product Description Problems

Product descriptions are where all the relevant information about the products is stored. If this area is wrong even by a little bit, you’re going to be providing the customers with false information which may result in the customer returning the products in the future again at your expense. You may also find that customers aren’t purchasing a product because the description isn’t a true representation of the product.

## Security Issues

Security is possibly one of the biggest issues regarding ecommerce simply because of the incredibly amount of vulnerabilities that web servers and ecommerce sites have in general. I will cover a lot of the security issues later in the report however things like hacking, viruses and DDOS can all compromise ecommerce sites in ways more than simply taking your website down. Hackers can exploit vulnerabilities in your ecommerce website to steal customer information that you have stored on your machines. Viruses can cause irreparable damage to some systems meaning you lose incredibly valuable data. DDOS or (distributed denial of service attacks) can be used to simply take your ecommerce site down in such a way that is very hard to fix until the attacker stops his/her attack. All these issues make Security one of the biggest problems to overcome with ecommerce sites.

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| --- | --- | --- | --- |
| Security Issue | Methods Of Overcoming | Pro’s | Con’s |
| DDOS | VPN’s | Helps prevent DDOS Attacks and can mitigate attacks. | Very expensive! |
| Virus | Antivirus Systems. | Scans all system files and downloads for viruses. | Time and resource consuming.  Costs. |
| Malware | Antimalware Systems. | Scans your systems for malware. | Costs.  Time and resource consuming. |
| Spam | Spam Filters | Helps prevent spam. | Can sometimes block something as spam that isn’t actually spam. |
| WORMS | Antimalware Systems. | Scans your systems for malware. | Costs.  Time and resource consuming. |
| Imposters (impersonation) | SSL, Register Multiple Domain names. | SSL helps people know that the website they’re on is the official one, buying multiple domains prevents the ways people can impersonate you. | Costs, people don’t always look to see if a website has SSL. There are a lot of domain names and you could miss one which would allow someone else to steal it. |
| Stealing (Hardware) | Ensure your server is in a secure and protected area, locks, camera’s and possibly other security measures such as biometrics. | Helps prevents people being able to steal your equipment. | Can cost a lot depending of the level of security. Doesn’t entirely stop people being able to steal. |

**Layout Plan.  
Security Threats:**

**Privacy of data being compromised:**

|  |  |  |  |
| --- | --- | --- | --- |
| Security Issue | Methods Of Overcoming | Pro’s | Con’s |
| Hacking | IP Restriction, Network Monitoring tools, IDS. | Limits a hacker’s ability to connect to your server and thus the ability for them to steal data. | Not full proof and can cause further problems in the future. |
| SQL Injection | Input Validation | Prevent someone from sending none valid Prevent someone from sending none valid queries. |  |
| Weak Passwords | Have a strong password policy. | Prevents customers and employees using weak passwords. | Can still be brute forced with time. |
| Trojan Horses | Antivirus software | Scans all system files and downloads for viruses. | Time and resource consuming.  Costs. |
| Packet Sniffing | Encryption (SSL) | Encrypts incoming and outgoing data so even if someone does sniff some packets, they’re unable to make sense of them | Costs.  Methods exist to overcome SSL encryption. |
| Backdoors | Purchase services from only well-known providers. | Lowers the chance that someone will have put a backdoor in your system. | Can be costly because you’re unable to shop around for the best deal. |

Security Issues in E-Commerce

There are a number of security issues that can effect an e-commerce website however, thankfully there are several ways to help prevent those issues arising. Each of the methods of overcoming the security issues has its pro’s and con’s, I will cover them below.

# Overall Security Issues

These are the issues that pose a threat to the overall e-commerce system and not just the data you’re storing upon your servers and other systems.

## DDOS

The first and most well-known type of attack in this sector is the DOS attack otherwise known as a denial of service attack. This can also refer to a DDOS which is otherwise known as a distributed denial of service attack. These type of attacks are aimed at one thing and one thing only which is removing the services offered by the company they’re attacking often to “prove a point” and other times to get the companies attention. These form of attacks work by bombarding the company’s servers with massive amounts of data and requests which in essence, overloads the connection between that companies servers and other people trying to connect. This type of attack is more of an annoyance than anything else to a company as it only blocks the services they’re offering and doesn’t actually remove them. The services are still there, they’re just behind a wall of data and requests.

#### Overcoming DDOS

There isn’t a lot you can help prevent a DDOS attack however the few things that are available to help prevent it are; VPN’s and Third Party Network Backbones.

###### VPN’s:

A VPN or Virtual Private Network is a form of protection against DDOS attacks as it hides your local server machines IP address and gives you a different outside IP Address, this makes it very hard for the attacker to attacks your network as when they initiate a DDOS attack against your external IP address all they’re attacking is the VPN service and not your website itself. When an attack occurs you can simply switch to a different VPN server.

Pros:

The advantages of this type of protection is that you are able to mitigate and even stop DDOS attacks as you can constantly keep switching VPN servers until the attacker gets bored and stops.

Cons:

The main disadvantage is the fact that this method of security can come with a hefty cost associated with it, it may start of very cheap however as your website grows you’ll inevitably need more VPN servers that you can use, the cost of having such a service can be very great. Another problem is that this still doesn’t prevent people DDOS’ing your network if they’re able to find your real internal IP address. While this does mitigate the risk, it does not remove DDOS as a problem.

## Virus

A virus is a malicious piece of code that is written for one and only one purpose which is to destroy data. This is often times the first pawn of war when someone else decides they want to cause damage to your data. This is because viruses can be very clever in how they destroy data so as not to be caught. Viruses can be devastating to a company and will often be nigh impossible to trace back to the perpetrator and on top of all that, a virus can go ahead destroying data for quite a while undetected causing massive damage to a company without ever being found and eradicated.

#### Overcoming Viruses

The simplest way to overcome the viruses issue is to simply install an antivirus application. Antivirus applications simply scan each and every single file on your system and check them for viruses, once it finds one it will put it into a sort of limbo area where you can then decide if it a virus or false positive.

Pros:

The simple advantage here is that you prevent viruses from being able to destroy on data on your system.

Cons:

The downside to antivirus applications are the amount of time and resources they can take up when scanning. The problem arises when you find you have to scan all the files on your system, however each scan means you have to use the read functionality of your hard drives, this takes up resources that might otherwise be needed to provide data to the e-commerce website. Antivirus applications can also be very costly depending on which you decide to go for. Some also have less features than others and some have virus databases that are slightly outdated which means a virus can slip through your protection.

## Spam

Spam mainly effects mail servers more than anything else. In a lot of cases at first, all client purchases will be sent to you in the form of an E-Mail at which point you can deal with it. Even if you don’t have that kind of system and it is a little more automated, you will still have things like customer support via E-Mail and Invoice copies via E-Mail. Spam is problem when this is the fact because it can overwhelm your inbox and make it hard to find things such as invoice copies and client complaints. Spam is just like junk mail that you sometimes get through your letterbox however instead of being physical it is electronical instead.

#### Overcoming Spam

The simple method of overcoming spam is a spam filter. A spam filter simply allows you to automatically ignore everything you don’t want in your e-mail system.

Pros:

Prevents spam.

Cons:

Can sometimes get false positives and count something as spam that actually isn’t. In those situations you are normally completely unaware of the false positive which can cause further problems such as customers thinking you are ignoring their e-mails or possible third party clients getting annoyed and choosing to not do business with you again in future.

## Imposters

Imposters are people who impersonate your website and use your company name as a basis to steal your customer’s money and information.

#### Overcoming Imposters

There are a few ways of overcoming this issue however I will only cover the main ones which are: SSL and Multiple Domain Registration. (More information on SSL further down the document)

SSL can’t directly help prevent you stop imposters impersonating your ecommerce site, however what it can do is offer customers and extra level of validity when browsing your website. This is because customers can consider any site they visit that has a valid SSL certificate is the official one. This is because there is a lengthy process of acquiring and setting up valid SSL certification.

The second more important and useful way of stopping impersonators is to simply limit the ways in which they can impersonate you. The best way to do this is to register (purchase) multiple domain names for your ecommerce website, this stops imposters from being able to use your actual company name as a basis for the impersonation. You can simply have all other domains redirect to the main one too so the upkeep and maintenance caused by having multiple domain names can be heavily limited.

Pros:

Stop imposters being able to impersonate your company and ecommerce website easily.

Cons:

Doesn’t stop them completely and there are extra costs associate with having to register multiple domains (while this isn’t that great of a cost).

## Stealing

Stealing is simply the act of someone stealing your physical hardware such as the hard drives or components of the server and other systems that would cause your overall ecommerce system to go down.

#### Overcoming Stealing

There are a massive amount of ways to stop people being able to steal, the main ones are:

###### House the Server and system securely:

Having your server and sensitive hardware in an area that can by protected by the following means if needed.

###### Physical Security such as Key Card Systems:

Key Card systems otherwise known as sign in and sign out systems are the most commonly used type of security systems above all others. They normally work by side of security guards as an extra layer of security however you can have them work on their own. A key card system is simply a card reader much like the one you use at a bank that you scan you key card (a small credit card looking device as shown below) through to gain entry into a section of the company or even into the company or building at all if you have the correct permissions to do so.

###### Biometrics such as Finger Print Scanners:

Much like the iris scanner, a finger print scanner takes advantage of the fact that no two people have the same finger prints. It scans your finger print to make sure you are who you say you are and also makes sure you have access rights to access that area. More advanced fingerprint scanners will also check to make sure the temperature of the finger is within normal human guidelines and that there is a steady heartbeat there too. This is to make sure that the fingerprint is actually a person and not just a very good cast of a finger print.

###### Extra Employees such as Guards:

Security guards are staff members that have qualification in protecting things by adding a human layer of security into the mixture. Most other forms of security can be fooled however a security guard is a person that has their own senses and can tell when something is not quite right. They’re also able to dish out force if the need arises and are good to have in place of areas that need extra security from people who would otherwise causes malicious harm or steal.

Pros:

Prevents people from being able to physically steal hardware.

Cons:

The biggest downside to this is that it simply costs to implement all of the above mentioned things. It doesn’t cost a lot for key card readers and systems in general, it doesn’t even cost a lot for decent fingerprint scanners these days. The costs come into it when you consider the extra staff you may have to employee or at the very least the premises you may have to purchase in order to safely store your system. Also you need to ensure that you secure area has the correct infrastructure such as internet access and heat dispersion for your server/servers.

In a lot of cases you would have you server located on the premises of server provider and use colocation to host your server and ecommerce infrastructure.

# Data Security Issues

These are the issues that directly relate to an overall bigger issue which is hacking to steal or corrupt ecommerce data/information. All of the below threats can be used to steal ecommerce information such as company and client bank details or private information. This is a huge issue with ecommerce because of the amount of threats associated with it and because of the Data Protection Act Law.

## Hacking

Hacking is the process of the using one of the below methods to gain access into a system illegally. Hacking is the number one problem above all else that all ecommerce websites have to deal with. There is no direct way to stop hacking however there are several ways to prevent the methods in which hackers use gain access to your ecommerce website.

## SQL Injection

SQL injection is a process in which malicious attackers can implant SQL queries that can be used to gather information and otherwise request information from an SQL database that the attacker should not be able to have access to.

#### Overcoming SQL Injection

The best way to overcome SQL injection as a threat to your ecommerce system is set out a specific set of queries that you are able to do without full administrative permissions and ignore or refuse anything else. Also have the system log any attempt to query in a way that isn’t allowed so you can help prevent anyone from using SQL injection to try access your database/databases. This form of protection is also known as input validation.

Pros:

Prevents people from using SQL injection as a form of attack on your database to steal information or cause damage.

Cons:

It is incredibly hard to anticipate every possible attack that someone could do using SQL injection and thus isn’t full proof.

It can produce a lot of false positives because of the information that is stored in the database can sometimes directly link into things you want to blacklist such as if the term “exec” is blacked then you’re also blocking anyone with the title “Executive”.

## Weak Passwords

Weak passwords are simply the process of using a password such as “12345”. This is a problem because it’s incredibly easy by attackers to simply guess your password and gain access to things they shouldn’t have access to.

#### Overcoming Weak Passwords

The single best way to overcome having weak passwords used by some of your clients and employees is to simply have a company policy in place for employees and validation in place for clients to ensure they use passwords that are strong such as one that includes upper and lower case letters, numbers as-well as special characters.

Pros:

Prevents people using passwords that would be far too easy to guess and thus gaining access to thing they shouldn’t have access to.

Cons:

Passwords can always be brute forced if needed and there are very few passwords that computers can’t figure out today given how powerful computers are becoming given if enough time and patience.

## Trojan Horses

Trojan horses are viruses that are disguised to look like something else that isn’t harmful to your system, this is done in the attempt to try fool either the user or the system itself into letting the virus have full access to your system. These can be a threat to data as a viruses’ main job is to destroy everything and replicate to the point of no return where your server can’t handle it anymore.

#### Overcoming Trojan Horses

The best way to overcome Trojan Horses is to simply implement an antivirus application on your system. Because Trojan Horses are simply very well hidden viruses, normally most virus protection software can prevent it.

Pros:

Allows you to prevent Trojan horses gaining access to your system and thus your data.

Cons:

The cons are the same as the ones of virus protection for viruses used above:

The downside to antivirus applications are the amount of time and resources they can take up when scanning. The problem arises when you find you have to scan all the files on your system, however each scan means you have to use the read functionality of your hard drives, this takes up resources that might otherwise be needed to provide data to the e-commerce website. Antivirus applications can also be very costly depending on which you decide to go for. Some also have less features than others and some have virus databases that are slightly outdated which means a virus can slip through your protection.

## Packet Sniffing

Packet sniffing is the process of gathering all incoming and outgoing data on a given network and then piecing it together to gain information that is being sent and received. Someone who wants to sniff packets on a given network doesn’t even have to have direct access to the network either, they can take advantage of wireless access points within your company that you use to access your administrative areas of your ecommerce website.

#### Overcoming Packet Sniffing

The best way to overcome network sniffing is to encrypt all the data on your ecommerce website. This best and most used way to do this is SSL. SSL or secure socket layer works to protect the data that is being transferred on a network. It is not used to directly protect your data on a server however it is used to protect the data that is being transmitted both to and from your protected network. SSL uses a simple key passes system to make sure both keys are never viewable to anyone accept the host and the server this means the data that is transmitted to and from the server is always encrypted.

How it works: You have two systems, one is the host (client) and the other is the server. The client sends the server an open digital padlock at which point the server puts its key inside said padlock with another open digital padlock and closes it to send it back. The client then receives its original digital padlock back and opens it up with its key. Now the client has the server’s key and the server’s digital padlock, now the client puts its key inside the server’s digital padlock, closes it and sends it back to the server. Now the server opens his digital padlock and thus has both keys. Using this system means the keys have never been seen in public however both the client and the server have the keys to use.

Pros:

Encrypts all network traffic meaning that even if someone was to gain all the packets from the communication between an ecommerce server and a customer, they wouldn’t be able to see anything other than a bunch of mixed up jargon.

Cons:

There are ways in which hackers can decrypt the information that they sniff from the network still. This is very hard and a very slow process however it is still possible for dedicated hackers that want to gain information from your network.

## Backdoors

Backdoors are exactly what they sound like, they’re gaps in security that malicious coders can use to completely access the whole system. Backdoors are normally written directly into the applications and services you’re running/using and thus give an attacker full access to areas that may hold sensitive data/information.

#### Overcoming Backdoors

The simple and only way to defend yourself against backdoors is to make sure you go with a reputable company for any third party services or products that you may need. Don’t go with the smaller less known companies as the chances of possible back doors increases with those. However it has to be said that backdoors aren’t something you see a lot of today.

Pros:

Decreases the chance that the software and hardware you’re using will have a backdoor in it.

Cons:

Doesn’t always prevent it as it only takes one clever programmer to implement it without anyone noticing in any business. Though most big companies have policies in place to prevent it too.

# Security Conclusion

In conclusion I believe that the following security features should be implemented to help prevent security threats in the future upon your ecommerce website.

## SSL

SSL encryption is a must have upon any ecommerce website as it adds a layer of protection on the data that is being transmitted to the ecommerce servers and back to the clients. It encrypts all data traffic so only the ecommerce server and the client’s computer can understand it. This is a must have because of the amount of personal and sensitive information that is going to be transferred to and from the website.

## Anti-Virus

Anti-Virus is a must have because of the amount of things it helps protect your servers and system from. Not just viruses but also Worms and Trojan horses. In this day and age with the amount of malicious viruses and other things out there, an anti-virus application is a must have. Without one you are simply opening up your systems to attacks from hundreds of different types of viruses, worms or Trojan horses.

## Password Policies

This is a much have because the last thing you want is for such an easy point of access for hackers to exploit. Passwords are in most cases the first line of defence against hackers and attackers in general, as such a policy should be in place that ensures that those passwords are as strong as possible.

## Anti-Theft Measures

The last thing I believe is a must have applies directly to the hardware that is running your ecommerce website. There are many ways to prevent someone hacking into your system however there is only one way to prevent someone physically stealing the hardware itself. By implementing some form of anti-theft measures, you’re ensuring that the physical machine is protected against any theft and even against malicious physical damage. The best way to do this would be collocating so you can take advantage of a third parties facilities and infrastructure however any of the above mentioned security measures can be applied (most for very little cost).

## BUDGET!

The last thing you have to take into consideration when it comes to security with an ecommerce website is to have a security budget. It’s all well and good having all the measures you can possibly think of to help ensure the security of your website however you also need to have something in place to help you cope with threats that may occur that you haven’t foreseen. Having a budget set aside for security allows you to have money available to you for the event that you need to implement something at short notice such a third party service or data recovery service in the event a virus gets into your system.