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## SECURITY ISSUE OF CLOUD COMPUTING IN E-COMMERCE SECTOR

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**Abstract:** Cloud Computing is one of the important and popular topic. It emerges as a new computing paradigm which aims to provide reliable and customized computing environments for end-users. From the past few years, there has been a rapid progress in Cloud Computing. Electronic Commerce is major of them. Cloud based e-commerce application enable IT and business leaders to evaluate new opportunities without large upfront investments. With the increasing number of companies resorting to use resources in the Cloud, there is a necessity for protecting the data of various users using centralized resources. But the major issue in cloud computing is security. This paper has discussed the concept of Cloud Computing and e-Commerce and on the basis of this issue analyzes its impact and security.

**Keywords:** Cloud Computing, e-Commerce, Dos.

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**Introduction:** Cloud Computing has now become a scalable services consumption and delivery platform in the field of Services Computing. Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. The technical foundations of Cloud Computing include Service-Oriented Architecture (SOA) and Virtualizations of hardware and software. The goal of Cloud Computing is to share resources among the cloud service consumers, cloud partners, and cloud vendors in the cloud value chain. The resource sharing at various levels results in various cloud offerings such as infrastructure cloud (e.g. hardware, IT infrastructure management), software cloud (e.g. SaaS focusing on middleware as a service, or traditional CRM as a service), application cloud (e.g. Application as a Service, UML modeling tools as a service, social network as a service), and business cloud (e.g. business process as a service).

A hybrid computing model enables an organization to leverage both public and private computing services to create a more flexible and cost-effective computing utility:

1. The public cloud is a set of hardware, networking, storage, service, and interfaces owned and operated by a third party for use by other companies or individuals.
2. A private cloud is a set of hardware, networking, storage, service, and interfaces owned and operated by an organization for the use of its employees, partners, and customers.
3. In a hybrid cloud environment, an organization combines services and data from a variety of models to create a unified, automated, and well-managed computing environment.

Whether your cloud is public, private, or hybrid, you'll need a cloud provider that provides elasticity,

scalability, provisioning, standardization, and billed usage. Elasticity is important because it means that you are able to use a service for a long or short period of time based on need. You can add more services from a self-service portal rather than wait for IT to do the heavy lifting for you. Increasingly, as companies begin to understand that they will use a combination of different platforms to meet different business needs, the hybrid cloud will become the foundation for computing. The advent of the hybrid cloud will also help redefine the purpose and use of the traditional data center as well.

**E-Commerce:** The term "Electronic commerce" (or *e-Commerce*) refers to the use of an electronic medium to carry out commercial transactions. Most of the time, it refers to the sale of products via Internet, but the term *e-Commerce* also covers purchasing mechanisms via Internet (for B-To-B).

A client who purchases on the Internet is called a cyberconsumer. *E-Commerce* is not only limited to online sales, but also covers:

- Preparation of estimates online
- Consulting of users
- Provision of an electronic catalog
- Access plan to point of sales
- Real-time management of product availability (stock)
- Online payment
- Delivery tracking
- After-sales service

In certain cases, electronic commerce makes it possible to highly customize products, in particular when the electronic commerce site is linked with the production system of the enterprise (e.g. business cards, customized items such as T-shirts, cups, caps, etc.)

Finally, insofar as electronic services and products are concerned (MP3 files, software programs, e-books, etc.), electronic commerce makes it possible to receive the purchase in a very short time, if not immediately.

Online stores: Most electronic commerce sites are online stores which have at least the following elements at the front-office level:

- An online electronic catalog listing all products for sale, their price and sometimes their availability (product in stock or number of days before delivery);
- A search engine which makes it possible to easily locate a product via search criteria (brand, price range, key word, etc.);
- A virtual caddy system (sometimes called *virtual cart*): This is the heart of the e-commerce system. The virtual caddy makes it possible to trace the purchases of the client along the way and modify the quantities for each reference;
- Secure online payment (*accounting*) is often ensured by a trusted third party (a bank) via secure transaction;
- An order tracking system, which allows tracking of order processing and sometimes provides information on pickup of the package by the shipper.

A back office system allows the online dealer to organize its offerings online, modify prices, add or remove product references as well as manage and handle client orders

In the emerging global economy, e-commerce and e-business have increasingly become a necessary component of business strategy and a strong catalyst for economic development. The integration of information and communications technology (ICT) in business has revolutionized relationships within organizations and those between and among organizations and individuals. Specifically, the use of ICT in business has enhanced productivity, encouraged greater customer participation, and enabled mass customization, besides reducing costs. With developments in the Internet and Web-based technologies, distinctions between traditional markets and the global electronic marketplace—such as business capital size, among others—are gradually being narrowed down. The name of the game is strategic positioning, the ability of a company to determine emerging opportunities and utilize the necessary human capital skills (such as intellectual resources) to make the most of these opportunities through an e-business strategy that is simple, workable and practicable within the context of a global information milieu and new economic environment. With its effect of leveling the playing field, e-commerce coupled with the appropriate strategy and policy approach enables small and medium scale enterprises to compete with large and capital-rich businesses.

On another plane, developing countries are given increased access to the global marketplace, where they compete with and complement the more

developed economies. Most, if not all, developing countries are already participating in e-commerce, either as sellers or buyers. However, to facilitate e-commerce growth in these countries, the relatively underdeveloped information infrastructure must be improved. Among the areas for policy intervention are:

- High Internet access costs, including connection service fees, communication fees, and hosting charges for websites with sufficient bandwidth;
- Limited availability of credit cards and a nationwide credit card system;
- Underdeveloped transportation infrastructure resulting in slow and uncertain delivery of goods and services;
- Network security problems and insufficient security safeguards;
- Lack of skilled human resources and key technologies (i.e., inadequate professional IT workforce);
- Content restriction on national security and other public policy grounds, which greatly affect business in the field of information services, such as the media and entertainment sectors;
- Cross-border issues, such as the recognition of transactions under laws of other ASEAN member-countries, certification services, improvement of delivery methods and customs facilitation; and
- The relatively low cost of labor, which implies that a shift to a comparatively capital intensive solution (including investments on the improvement of the physical and network infrastructure) is not apparent.

It is recognized that in the Information Age, Internet commerce is a powerful tool in the economic growth of developing countries. While there are indications of e-commerce patronage among large firms in developing countries, there seems to be little and negligible use of the Internet for commerce among small and medium sized firms. E-commerce promises better business for SMEs and sustainable economic development for developing countries. However, this is premised on strong political will and good governance, as well as on a responsible and supportive private sector within an effective policy framework. This primer seeks to provide policy guidelines toward this end.

**Types of e-commerce application:** There are various types of e-Commerce facility is used some of them are:

- Retail and wholesale
- Marketing
- Finance
- Manufacturing
- Auction

Cloud computing is another disseminating sector that has no way back, Cloud is impacting the growth of ecommerce sector with very considerate steps and has key role in its advancement. CFOs and CIOs are initiating to the adoption of Cloud after knowing its technical and financial benefits.

General issues that are faced by ecommerce applications using traditional methods are:

1. Downtime
2. No flexibility
3. High CAPEX
4. Security issues

**The benefits of cloud computing to the e-Commerce industry:** Technological advances have transformed the way we live our lives; be it working, socializing or spending our money. Convenient, safe and quick innovations have meant that we can exist without even having to leave our homes, should we so wish.

Shopping online is one facet that has continued to grow; dominating the high street offering and gaining popularity with consumers. This is thanks, in part, to the ease at which prices can be compared, deals found and transactions completed.

It's fair to say that the ecommerce industry has grown and developed in parallel with the internet. Given that the very basis of ecommerce relies on the internet, keeping up with modern advancements is essential. So what is everyone talking about at the moment? Cloud computing.

Cloud computing is increasingly being considered as a valuable business investment, vital for success. Here are just a few of the benefits it brings to the ecommerce industry:

**Copes with peak consumer demand:** One of the biggest draws of managed private cloud computing is its scalability. It can help businesses cope with increased visits and activity far more efficiently than in-house applications, servers or software could. As users are not restricted to just one server, they can scale up their resources in busy periods, i.e. the run up to Christmas, ensuring they have the capability to facilitate increased numbers of sales. The extra resources can be 'switched off' as and when demand levels back out again, so nothing is sitting unused - nor any money being wasted.

**Can bring significant cost savings:** Typically, cloud computing works on a pay-as-you-go basis, whereby a client will only pay for the services it has used that month. Add that to the negated investment into equipment, software updates and maintenance, you'll find that it is far cheaper than operating an in-house system. It is also cheaper to use the cloud provider's storage, databases and services. Ecommerce businesses could find they save money chiefly because of the convenient and flexible scalability that the cloud offers.

**Creates competition:** The pay-for-what-you-use nature of cloud computing means it is a resource easily afforded by businesses of all sizes, therefore allowing smaller retailers to compete with their larger rivals due to economies of scale. At its most very basic level, cloud computing makes ecommerce an affordable option. Plus, it gives consumers more choice, opening up a more varied online retail market.

**Recovery:** The extreme effects of nature can close a workplace down, interrupting power supplies or affecting performance of the server on which all online activity is held, thus resulting in lost business. Using the cloud, however, negates all of these worries. Hosted separately, incidents that befall the physical place of business won't have any effect. Services will run as usual and customers will never know there has been a problem.

**E-Commerce Security issue:** E-commerce systems are based upon internet use, which provides open and easy communications on a global basis. However, because the internet is unregulated, unmanaged and uncontrolled, it poses a wide range of risks and threats to the systems operating on it.

The use of the internet means that your internal IT and e-commerce systems are potentially accessible by anyone, irrespective of their location.

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**Threats from hackers and the risks to business:** Some of the more common threats that hackers pose to e-commerce systems include:

- carrying out denial-of-service (DoS) attacks that stop access to authorised users of a website, so that the site is forced to offer a reduced level of service or, in some cases, ceases operation completely
- gaining access to sensitive data such as price lists, catalogues and valuable intellectual property, and altering, destroying or copying it
- altering your website, thereby damaging your image or directing your customers to another site
- gaining access to financial information about your business or your customers, with a view to perpetrating fraud
- using viruses to corrupt your business data

**Impact of a security incident on the business:** If your website is hacked into, it can have a significant impact upon a business running an e-commerce

service. The potential business implications of a security incident include the following:

- direct financial loss as a consequence of fraud or litigation
- subsequent loss as a result of unwelcome publicity
- criminal charges if you are found to be in breach of the Data Protection or Computer Misuse Acts, or other regulation on e-commerce
- loss of market share if customer confidence is affected by a DoS attack

The image presented by your business, together with the brands under which you trade, are valuable assets. It is important to recognise that the use of e-commerce creates new ways for both image and brands to be attacked.

#### **Security Attacks in Cloud:**

1. Denial of Service (DoS) attacks: Some security professionals have argued that the cloud is more vulnerable to DoS attacks, because it is shared by many users, which makes DoS attacks much more damaging. Twitter suffered a devastating DoS attack during 2009.
2. Side Channel attacks: An attacker could attempt to compromise the cloud by placing a malicious virtual machine in close proximity to a target cloud server and then launching a side channel attack.
3. Authentication attacks: Authentication is a weak point in hosted and virtual services and is frequently targeted. There are many different ways to authenticate users; for example, based on what a person knows, has, or is. The mechanisms used to secure the authentication process and the methods used are a frequent target of attackers.
4. Man-in-the-middle cryptographic attacks: This attack is carried out when an attacker places himself between two users. Anytime attackers can place themselves in the communication's path, there is the possibility that they can intercept and modify communications.
5. Network Security:
  - Network penetration and packet analysis
  - Session management weaknesses
  - Insecure SSL trust configuration.
6. Web Application Security:
  - Injection flaws like SQL, OS and LDAP injection
  - Cross-site scripting
  - Broken authentication and session management
  - Insecure direct object references
  - Cross-site request forgery
  - Insecure cryptographic storage
  - Failure to restrict URL access
  - Insufficient transport layer protection
  - Un-validated redirects and forwards

**Solution approaches:** The following outlines four distinct security technologies –firewall, intrusion

detection and prevention, integrity monitoring and log inspection- that can be deployed as software on virtual machines to increase protection and maintain compliance integrity of servers and applications as virtual resources move from on premise to public cloud environment

**Firewall:** Decreasing the attack surface of virtualized servers in cloud computing environments. A bi-directional firewall, deployed on individual virtual machines can provide centralized management of server firewall policy. It should include predefined templates for common enterprise server types and enable the following:

1. Virtual machine isolation
2. Fine-grained filtering (Source and Destination Address, Ports)
3. Coverage of all IP-based protocols (TCP, UDP, ICMP, ...)
4. Coverage of all frame types (IP, ARP, ...)
5. Prevention of Denial of Service (DoS) attacks
6. Ability to design policies per network interface
7. Location awareness to enable tightened policy and the flexibility to move the virtual machine from on premise to cloud resources.

**Intrusion Detection and Prevention (IDS/IPS):** Shield vulnerabilities in operating system and enterprise applications until they can be patched, to achieve timely protection against known and zero-day attacks. As previously noted, virtual machines and cloud computing servers use the same operating systems, enterprise and web applications as physical servers. Deploying intrusion detection and prevention as software on virtual machines shields newly discovered vulnerabilities these applications and OSs to provide protection against exploits attempting to compromise virtual machines.

**Integrity Monitoring:** Integrity monitoring of critical operating system and application files (files, directories, registry keys and values, etc.) is necessary for detecting malicious and unexpected changes which could signal compromise of cloud computing resources. Integrity monitoring software must be applied at the virtual machine level.

**Log Inspection:** Log inspection collects and analyzes operating system and application logs for security events. Log inspection rules optimize the identification of important security events buried in multiple log entries. These events can be sent to a stand-alone security system, but contribute to maximum visibility when forwarded to a security information and event management (SIEM) system or centralized logging server for correlation, reporting and archiving. Like integrity monitoring, log inspection capabilities must be applied at the virtual machine level. Log inspection software on cloud resources enables:

1. Suspicious behavior detection

2. Collection of security-related administrative actions
3. Optimized collection of security events across your datacenter

**Conclusion:** This paper showed the basics of Cloud Computing, and its possibilities of use in the e-Commerce Sectors. The concept of cloud computing comes from the network diagrams illustrating the Internet as a cloud, where it is not possible, or not important, to know the information path. While the main reasons for adopting services based on cloud computing are cost saving, flexibility and start-up speed, there are still doubts about the security guarantees and the portability and integration options offered by this model of services.

This paper illustrates the basic fields of e-Commerce where cloud computing is use and the criteria of cloud computing its features and its security issue

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