## CHALLENGES IN COMPUTING TODAY

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Abstract-This paper reviews the challenges faced by ordinary users in the domain of computing today.As there are numerous problems in computing,with each problem centered around different issues and each one requiring unique technological solutions,this paper classifies the assessment domains and tries to identify a solution for each of the problem specified below by explaining each of them and checking their relevancy in the computing world today

- i. Information security
- ii. Cost of software deployment and maintenance
- iii. Cost of hardware deployment and maintenance
- iv. Manageability of multiple applications
- v. Complexity
- vi. Cost of acquisition

### Introduction

The discipline of computing is the systematic study of algorithm process that describe and transform information:their theory, analysis, design, efficiency ,implementation and application.With the rapid development of new concepts of computing ,it becomes increasingly clear that the technology backed computers of today must evolve in order to meet the demands of consumers today.Information technologies and the computing base that enables them are pervasive. From the desktops of business and home users to the massive, distributed data centers that regulate commerce and control, critical infrastructure, the world has come to depend on the availability of information and communication technology. This infrastructure grows more complex as the underlying computational and communications capabilities double in speed and capacity and so is our dependancy on information technology.We currently face numerous threats of massive

disruptions resulting from denial of service, loss of privacy, alteration of critical data and new forms of threats.

#### **1. INFORMATION SECURITY:**

As the computer world reels in response to the frequent security incidents, industry analysts, government officials, and software vendors are sparring over how to address the vexing problem of computer security in a networked age.According to the statistics "for 52% of the networks, the perimeter is the only defense" which means that once the limited perimeter security of a computer network is penetrated, the network is at risk. Breach of security has become a norm today with more and more privacy issues cropping up.Infringement of security have resulted in serious data loss or the exposure of sensitive national security information.Observers say the attacks vividly demonstrate a vulnerability that could result in disastrous losses in the future. According to a study released, compiter security breaches are up by 24% from 2008 to 2009, and that computer related crimes including security breaches have cost 241 surveyed organisations \$136 million last year.

In the near terms,the IT industry will certainly continue to arm itself against the growing threats .The attackers are gaining ground daily.The researching community is being looked upon to innovate along four dimensions,the grand challenges for trustworthy computing:

i) Develop new approaches for eradicating widespread,epidemic attacks in cyberspace.

ii) Ensure that new, critical systems currently on the drawing board are immune from destructive attacks.

iii) Provide tools to decision makesrs in government and industry to guide future investment in information security

iv) Design new computing systems so that the security and the privacy aspects of those systems are understandable and controllable by the average user.



The above graph vividly shows the increase in computer security threat over the period 2002-2008.

The advantage of using a Free and Open source software in computing sphere today is that- more people can inspect the source code to find and fix a possible vulnerability.

\_The end-user of open source code has the ability to change and modify source to implement any extra "features" of security they may wish for a specific use, which can extend to the kernel level if they so wish.

# 2.COST OF SOFTWARE DEPLOYMENT AND MAINTENACE:

Software maintainance denotes any changes made to the product after it has been delivered to the customer.Software products need maintainance to correct errors, enhance features, port to new platforms etc.

The software maintainance work is currently much more expensive and takes more time to implement than what is affordable.Majority of the software products needing mainteinance are the legacy products that are hard to maintain and have poor documentation, unstructured code and nonavailability of personnel who are knowledgeable about the product.The maintainance efforts constitue about 60% of the total life cycle cost for a typical software product. According to Boehm's maintenance cost estimation relation model,

AME=1.0\*ACT\*SDT

Where AME-annual maintenance effort

SDT-software Development Time

### ACT-Annual Change Traffic

There is a notion of pre-delivery/pre-release maintenance which is all the good things done to lower the cost of ownership of the software like compliance with the coding standards that include software maintenability goals,management of coupling and cohesion of the software,attainment of software supportability goals etc.

Open source software is mostly high-quality software. When one uses the open source software, the source code is ,made available and is welldesigned. Hence they are efficiently used in coding

### **3.COST OF HARDWARE DEPLOYMENT:**

No matter which brand a customer buys, it has components of varied manufacturers of varying quality. If you buy a major brand, you will usually pay a lot more money & get the "lowest common denominator" parts inside. Rich companies or a common user who do not know computers, buy these kind which usually work fine but are proprietary computers that are difficult to upgrade & are more expensive. Few of the hardware related problems include Limited selection of components, Fake brand name, Defective products, varied standards of quality & acceptability across the globe, Loss of productivity, waste of work, time, energy, salary etc.

To overcome the hardware problems one can add more headcounts for free .This strategy will reduce costs because the manufacturer will take care of all the repairs & can provide service where the computer is located.

The tightening of the budget is causing some companies to step up use of open-source software.. While open-source software is already widely used to help businesses run their servers and database management systems, it's gaining wider acceptance in areas like collaboration, customer relationship management, supply chain management etc

Since Linux and open source softwares are easily portable and compressed, it takes lesser hardware power to carry out the same tasks when compared to the hardware power it takes on servers, such as, Solaris, Windows or workstations. With this less hardware power advantage, one can even use cheaper or older hardware and still get the desired results.

## 4.MANAGEABILITY OF MULTIPLE APPLICATION:

Maximizing the utilization of the computing resources provided by handling of multiple applications requires adjustments both to the operating system & to the existing application software.From an architectural point of view, ultimately a single cpu designs may make better use of the silicon surface area than a multiprocessing core.So a development committment to this architecture may carry the risk of obsolescence. A program that needs more system resources must get them from other programs that are running, making it easy to encounter problems where a poorly programmed application won't let any other applications access any of the resources it is using. This leads to all manner of trouble, including system instability and sometimes even preventing users from switching between programs because a rogue program is taking up most of the system resources and not checking to see if the user is trying to switch to another application.

### **5.COMPLEXITY:**

Most of the complex computer sets are built using micro programmed code,rich in high level instruction sets and complex instruction decoding logic.

Earlier generation of a processor family is generally contained as a subset in every new version of instruction set.Hence chip hardware become more complex with each generation of computer.This means that different instructions will take different amount of clock time to execute, slowing down the overall performance of the machine. Many specialized instructions are not used frequently to justify their existence. Approximately 25% of the available instructions are used in a complex program.

The complex computer sets come at a premium price & not all complex software is compatible across platforms.

Some of the examples of these micro computers are IBM midrange computers,K202,VAX series etc.

### 6.COST OF ACQUISITION:

Acquisition cost is the pretax amount of money it costs to gain title to any property.

There is a false assumption in computing fraternity that the cost for setting and running the computer is free. This is far from being true. There are costs right from buying the routers to costs for securing the network, cost for leasing the bandwidth for internet connections and costs for operating & maintaining the network. Once a system is ready to use, it will fail if we do not take into account the costs for keeping the services up, running and responsive and to regularly upgrade the already installed services and softwares in a computer.

Free and Open source software helps in license Acquisition as when users opt for open source software so that they would no longer need to worry about licenses, thereby minimizing add-on expenses. Open source software enables you to install it several times and also use it from any location. The end users, can hence be free from monitoring, tracking or counting license compliance.

### CONCLUSION:

With almost a decade since the challenges faced in computing were discovered,the characteristics & underlying problems remain pretty much the same.What is more alarming is that architects,designers & developers are still tempted to wave some of these problems off thinking technology solves everything. We should not forget that applications evolve & grow.So even if things look okay for a while, if we do not pay attention to the issues, they will rear their ugly head and bite us.

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