

A Survey of "Virtualization Smartphones Platform": Real Time Mobile System

Mr. Dhruv Rajneesh Bhardwaj¹ Prof. R. A. Agrawal²

¹Student ²Assistant Professor

^{1,2}Department of Computer Science & Engineering

^{1,2}Hindi Seva Mandal's, Shri Sant Gadge Baba College of Engineering & Technology, Bhusawal - 425203, Dist. – Jalgaon, Maharashtra, India

Abstract— "Virtualization Smartphones Platform" is widely used in the IT industries, since this platform reduces their security issues and solves the other problems also. The major problem faced by almost all the IT industries is the BYOD problem, because of which the data sharing among the employees is not safe at the server level. But still industries have to made the data/information available to the employees anywhere and anytime whenever required, and they have to compromise with the security issues. But with Virtualization Smartphones Platform this problem of BYOD is solved very easily, this platform allows the industries to run more than one OS or VM in the single device or on the single kernel. Through this approach, industries made the applications and data available on the one VM and the private data and other important data on the other VM which cannot be accessed by the undesired users. This platform of virtualization smartphones is easily adaptable, compatible, and easier to learn/understand, hence its demand in the market is growing rapidly and continuously. In this survey, we learn about the existing virtualized smartphones technologies in the market and they help the in the development of the IT industries.
Key words: OS (Operating System), VM (Virtual Machines), Virtualization, Sensor Redirection. BYOD (Bring Your Own Cloud/ Device)

I. INTRODUCTION

"Virtualization Smartphone" is virtualized hardware designed for the devices like smartphone, desktops/tablets etc. This hardware is widely used in the mobile phones or wireless connected devices, this enables these smartphone devices to run multiple OS's (Operating Systems) or VM (Virtual Machines) on a single machine. Hardware Abstraction Layer (HAL) allows multiple OS's to run in a single machine. In today's world, Smartphones have become an important part of your life, especially in modern societies, and employees working in corporations uses their smartphone to resolve their purposes in offices. Connecting phones to the corporate network itself doesn't create any problem, but downloading various applications on their devices leads to downloading of various malicious applications too that affects the both; the user and the corporation. The absence of anti-viruses in the devices makes them more prone to the malicious applications; this puts the corporate organizations into the dilemma (complex situation) to choose amongst the company's security and the employee's creativity. This is nothing but the BYOD (Bring Your Own Cloud/ Device) issue, which is very common in corporate sector; this can be easily resolved using 'Virtualization Smartphones Platform [2]'. Allowing the use of BYOD devices in the corporate companies requires certain policies to manage their use and also to maintain the end-user flexibility. Due to this reason,

the demand for the 'virtualized devices' have been growing rapidly in the corporate especially in IT companies and Computer industries. To achieve this, various technologies have been introduced in the market which ranges from the device management policies, to hypervisors and the separations based on containers etc [2].

II. LITERATURE REVIEW

In the today's changing world of the technologies the challenges for the data/information security for the companies, especially the IT industries, have been increased. These challenges regarding the security issue of the information is due to the BYOD problem, companies allow their employee to use their virtualized smartphones devices in the company's network so that the required information can be shared to the employees whenever they requires it, no matter where they are working. Connecting devices to the company's network is not itself a problem but when the employee downloads something on his device, this leads to the threat of malicious applications, which are downloaded from the network on the individuals device and gets access to the company's server too [2]. To solve this problem of BYOD the evolution the virtualized smartphones platforms occurs, this approach allows the companies to runs more than one OS or VM on the single OS device or VM. By this approach, companies are able to manage their essential data/information by keeping it in the VM which is not accessible to the employees by making it private for company's official use only. The information to be shared amongst the employees is made available in the OS or VM, from the employees can fetch information whenever required and anywhere. This reduces the threat of security among the company's officials [3]. The main reason for the growing demand of this approach of virtualized smartphones platform, is that they are easy to adopt, compatible, flexible to the users. These features make this platform more demanding in the corporate sector and many technologies like BlackBerry Enterprise Server, MobileIron and Good Technology amongst several more, have been developed to provide the virtualization in the virtualized smartphones devices [1]. This virtualization is nothing but the separation of the android platform to achieve the data/information security from the malicious application, and to prevent the information loss by the hackers.

III. EXISTING TECHNOLOGIES FOR 'VIRTUALIZATION SMARTPHONES' IN MARKET

A. Device Management Policy

These policies are managed by the Mobile Device Management (MDM) systems. In this the separation or virtualization of the OS's have been achieved using the "IT

security policy". This approach is implemented using the server based management approach, which allows the IT heads or managers to enforce these policies to the end user base which can be applied to the whole community or the basis of groups, so that it can be easily customized to various levels of securities required per group. Some of the examples of this approach are the: BlackBerry Enterprise Server Technology MobileIron Technology [1].

B. Hypervisors:

This approach allows user to run two or more OS's on the same virtualized device. This approach is mostly used by the peoples involved in the business field, since using this approach they can execute the personal applications and services in one OS while the business related services in the another OS. There are two types of this approach, they are;

1) Type I:

Bare Metal Virtualization: In this type, the hypervisor runs on the hardware level of the OS, and has the direct access to the hardware resources of the OS. Hence it provides the better hardware isolation and the security; also the multiple OS's can be controlled via single host only.

2) Type II:

Hosted Virtualization: In this type, the hypervisor runs within the host OS, also it execute its operation in the host OS's environment only. Types of the Hypervisors are shown below in the figure:

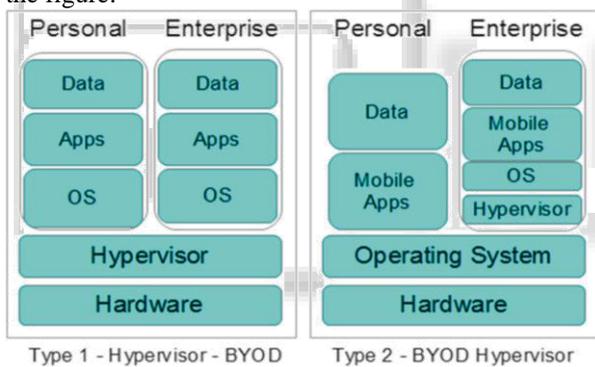


Fig. 1: Types of Hypervisors [1]

Containers Based Approach: In this approach, the virtualization of devices or the separation of devices is achieved using the single Kernel only. In this, the multiple sides of user, such as personal and the business sides are separated using the multi-user logged approach. Through this approach, the two or more sides of the end-users is achieved in the single kernel or OS only. By implementing this logic/approach one user can be implemented at single side and the user can be implemented on the other side.



Fig. 2: Implementation of Containers in an enterprise [1]

Virtualization Platforms in the Market: Market Analysis: Transition of the technology from the physical to the virtual hardware in the recent physical devices like, smartphones, desktops, tablets etc. has played an important role in development of the IT industries. This leads to the revolution in the IT sector, also it helps many small and middle scale business persons to grow their business and keep moving with the changing technology in this competitive environment. There are several platforms available in the market for 'virtualization of the devices', each has its own strengths. One of the most popular platform is the VMware and its latest version is "Vmsphere", it adds many new strengths to its older version. Firstly, the VMware has the small footprint which makes it the most demanding platform in Market; it means VMware requires only the 7MB of the space to get it running anywhere. VMware has its own operating system, hence making it the much better option for the users. Also it is proven for its high compatibility feature and hence is the much reliable choice for the users. Another competitor of the VMware is the Microsoft's "Hyper V Platform". One of the major reasons for the growing popularity of the HyperV is that, it is easy to install. Also it is much easier to understand and use by the user, hence its user friendly nature makes it more demanding in the market. HyperV is not better than VMware in comparison to its features but it's not that behind too. Finally the major player in this competition is Xen platform. This platform was developed in 1990 in Cambridge University research program. The most important feature of this platform is that it is an 'open source virtualization platform'. Since it's an open source platform you have to deal with the security scans, viruses, etc. especially in Windows. The main reason for its popularity in the today's market is that allows the user to set priorities of the OS's (Operating System) or VM's (Virtual Machine) running in the system or virtualized devices. With the other platforms like VMware, HyperV you can only set priorities to the memory or processor but with the Xen platform you can set priorities to the disk space utilization, network utilization, memory utilization etc and many more functionalities. Another major feature of the Xen platform is that it is easy to deploy. You can easily switch from the other virtualized platforms to the Xen platform, also it has 16TB single disk limit, this adds one more reason to choose Xen platform over the others. However with many feature and the strengths the Xen platform is not supported by the "Cloud Gateway Technology". This technology only supports the VMware and the HyperV platforms, hence again these platforms (VMware and HyperV) gets ahead in the competition with their support the cloud gateway technology.

IV. ADVANTAGES

- **Reduced Spending:** For the small and middle scale, IT companies or industries, with not more than 100 employees, the major expenditure is done on the hardware servers' establishment and purchasing. This increases their cost of production and reduces their profit, but the virtualized smartphone platform requires less server and this virtualized smartphone platform increases the lifespan of the hardware of the machine too. Hence it reduces spending of the industries.

- Easy Backup and Recovery: This is the one of the most important feature of the virtualized smartphone platform that they provide the easy backups and recovery of the data. Data loss is very common, it maybe due to interrupted power supply, natural calamities etc. which affects the business companies.
- Better Continuity in Business: Virtualization Smartphone Platform allows the users to access the software and the other relevant data/information and files anywhere they are and enables the multiple users to access the same data. In this manner, it provides the more continuity to the users and helps the IT sector.
- Increased Efficiency in IT operations: Virtualization Smartphone Platform provides the easy access to the software and the information and this helps the employees in the IT industry's to work with more efficiency without worrying about the resource allocation among the employees.

V. DISADVANTAGES

- Installation Cost: Virtualization to the Smartphone Platform requires the software as well as the hardware installation costs. Also it depends on the existing system of the industry, that how well and easily it can accommodate virtualization smartphone platform into its infrastructure.
- Skilled Employees: Adoption of the virtualization smartphone platform is quite easier but to use it to get the better outcome is also very essential for any industry. For this the industries must have the working force of the skilled employees those are masters in virtualization environment or the one who can easily accept the change inn the working environment due to the virtualization smartphones platform. This is a major issue for the small or middle scale industries.

VI. CONCLUSION

In the today's world of the consumerization in the IT sector, the BYOD problem and the other security related issues are the major challenges to all the IT industries. Through this survey report it can be easily concluded that the Virtualization Smartphones Platform's are the best solution to the BYOD problem in the IT sector. Also the issues related to the security of the data, expanding of business by the small/middle scale business companies, etc. are easily resolved with the virtualized Smartphones platform. Hence the virtualized Smartphones platforms have the good future in the IT sector and this platform is also easily too adaptable by the business persons at various scales. Therefore, we can conclude that virtualized smartphone platforms have good future in IT sector, especially in our country India.

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VII. FUTURE SCOPE

IT sector is growing rapidly and continuously, as per the reports this sector will be continuously provide the employment to the employees in the near future too. Also the virtualized smartphones platforms are proved to be the foundation stones of IT industries now-a-days, so in future also this platform will be widely used in the IT sector. Also with the changing environments many advancements will be made in the technology of the virtualizes smartphones platform, so this technological approach seems to be have a good future in the IT sector/market.

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