



eNlight Cloud

White Paper

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1. Purpose

The purpose of this document is to give a brief on eNlight Cloud and to explain the ability of the product to address current industrial challenges in Hosting. This document has been created solely on the basis of market research over the internet. This document is meant for information purpose only and should not be used for comparison with other similar products. All the comments made in this document are solely for eNlight Cloud and are not meant to criticise any company or their offering.

2. Introduction to eNlight

eNlight is a unique & patented product that can be defined as an intelligent cloud computing platform, which focuses on best performance of a virtual machine at minimum costs. eNlight works on the following principals:

1. **It allocates the resources as and when needed by the virtual machine, to achieve best possible performance.**
2. **It also removes the additional resources from the Virtual machine if not required, leading to effective economics.**

eNlight is **one of its kind** and the **first in the industry** to provide automatic scalable services. eNlight, with its iNtelligent technology, senses the need for additional resources and also the need to withdraw them, thus ensuring top notch performance at optimal prices.

One does not have to worry about resource allocation and server upgrade / downgrade cycles as eNlight will take care of all the needs and adjust the resources in real time automatically without having to reboot or a pause in the server. eNlight will free the world from the tedious process of server shut down and up-gradation of RAM, CPU or Disk.

eNlight is very easy to use and quick to setup. Creation of VM is available to the client as soon as the signup process is complete. From the in-house developed control panel, users can create a VM on their own as well as manage them without having a need to contact administrators. The provisioning of a single VM is done in less than 3 minutes irrespective of any OS required by the client. With eNlight, one can create a server within seconds and install your application in no time, with automatic resource allocation as per the application load.

2.1 The Idea

A virtual machine is a logical computing unit which is formed on a physical computing unit and works similar to a physical computing unit. A virtual machine facilitates co-existence of multiple OS environments on the same physical server or computer. Multiple Virtual machines (VMs) are installed on a physical server. Such physical servers along with the virtual machines form a virtual network.

eNlight Cloud is indigenously built Intelligent Cloud Computing platform. It provides Virtual machines to clients. The technology measures the resource utilizations in a virtual network and automatically detects the resource requirement associated with the virtual network. Further, upon detection of a resource requirement, the eNlight technology decides the type of resource i.e. either RAM or CPU, to be scaled and scales the resource in order to compensate the resource requirement of the virtual network.

We have developed this software with following objectives which need to be full-filled:

1. High Performance of servers
2. Unlimited resources
3. Automatic scaling of resources with no downtime
4. Security for Cloud
5. Faster server provisioning
6. Nullification of hardware failures
7. Minimize the IT expenses
8. Reduce carbon footprints
9. Automated Monitoring for the servers or VMs
10. Pay-as-you-consume billing model

2.2 Key Features & Uniqueness

eNlight is the solution to resource related problems faced on the servers, whether dedicated, VPS or any other type of hosting platform. The resources are monitored continuously; so whenever a load is detected on Virtual Server, the cloud allocates more resources to that server. The main advantage of this feature is – the resource size stays proportional to the performer's requirements.

Mentioned below are key features of eNlight:

1. Flexibility
2. Management
3. Performance
4. Elastic Storage
5. Reliability
6. Security
7. DRaS

3. Addressing Industry Challenges

3.1 Problem: Under Utilization of Resources

A study shows that 80% of the servers in the world are underutilized, out of which 90% of the servers are less than 30% utilised.

It means that most of the enterprises around the world are paying for resources that are not used at all or may be bought considering the fact that the company / organisation may need it sometimes in the future. Even if the servers are 100% utilised in the day time when the organization is working, it would not require them in the night when there is no business.

Solution:

The resource utilization of a virtual network changes dynamically. Resource utilization is less at times when fewer numbers of systems are accessing the resources and / or data traffic in the network is low. Whereas, when more numbers of users are accessing the resources and / or data rate is high, resource utilization is very high. At the time of resource overloading, resource scaling needs to be done to address the overloading condition. In existing virtual machine systems, at the time of resource requirement, allocation of new

resources and/or freeing of existing resources is done manually. In the web hosting industry, where resource requirements change dynamically, manual adjustments may affect the system performance and throughput.

It is suitable for sites that attract seasonal traffic specially those where announcements are made, results are declared. The same benefit holds for sites that require negligible resource consumption for a few hours every day (off-peak hours). Sites requiring high resource usage continuously can also be easily hosted using eNlight as its intelligent technology automatically detects the need for resource scaling.

3.2 Problem: Hardware Investments Not Cost Effective & Technology Adaptive

As per the information in point 3.1, enterprises invest in the infrastructure to ensure that it is sustainable to the growth that happens in at least next 5 years. However they do not realize that they are investing for something that might be needed after 5 years. By the time those servers are fully utilized, the hardware technology drastically changes and they have to again invest in the infrastructure with the same constraint of having them sustainable for 5 years.

Solution:

The pay-as-you-consume model is one feature that makes eNlight one of its kind. The concept “Pay-per-use” has now been widely used by most Cloud providers however, with eNlight you are not charged for the resources allocated to your VM but only for those that you use. As opposed to traditional IT billing techniques and other Cloud providers, eNlight is true to its commitment to bill as per Consumption. You will be charged only for the resources you use, thus completely eliminating hidden costs or surcharges. The pay-as-you-consume model of eNlight has following advantages that address the concern related to cost as well as hardware technology.

- **No hardware upgrades required:** With eNlight, the CAPEX of any Enterprise can be reduced to 50% of the current requirement. As eNlight is a virtual platform that allocates / de-allocates resources automatically as per the demand of the hour, resource allocation is no longer a matter of concern.
- **Intelligent Auto-scalable platform:** eNlight caters smoothly to the sudden surge in resource requirements. eNlight’s intelligent virtual platform scales up or scales down resources dynamically resulting in smooth functioning of the applications. Users can now access and download information from the application instantly.
- **Optimum resource usage:** eNlight provisions resources as per demand. During non peak hours, resources are de-allocated to ensure that necessary resources are only allocated when required. Users do not have to invest in procuring the right amount of hardware, thus saving almost 60% of their hardware costs. This also means that there are no costs of obsolete or outdated hardware components, including no wear & tear costs.

3.3 Problem: Upgrade, Downgrade of Hardware Involve Downtime & Are Expensive

The hardware investment calculations normally goes off the mark a few times for any company, where they possessed more hardware than their actual growth demanded and also fell short of the rapid demand at times. There are 2 approaches to the any hardware upgrade or downgrade:

1. they normally add or remove RAM or disk to the current server with a downtime of around 1-2 hours
OR
2. they would migrate the application to higher configuration server, if the demand of the resource is out of the current capacity or to a lower capacity server to save the cost.

Both these methods involve a considerable amount of downtime and sometime resulting to be very expensive in terms of time. The companies also have to pay heavily to vendors for getting their application running as on the old servers.

Solution:

The capability to meet the resource needs and still be flexible is the most important parameter that any user is looking for in a service provider. eNlight fulfils this requirement with the best technology available. The servers are not only provided with ample amount of resources but also with automatic resource scaling and monitoring service that ensured ample resource availability and performance at its best. Hence there is no need to migrate the servers for an upgrade or downgrade. Additionally the users don't have to for the resource that has not been consumed.

3.4 Problem: Down Time Due To Hardware Failures

Hardware failures cause more trouble than any other problem in IT industry because hardware failures are unpredictable. They cause major downtimes and sometimes huge loss of valuable data.

Solution:

The terminology "Cloud computing" may be defined as the collaboration of computing resources in a common place via a computer network. The term "Cloud" represents a "GRID of Computers" that effectively function together to supply data and software as required. It was consist of redundant hardware, hence in case if any hardware goes down the resources or VMs running on the faulty hardware is migrated to redundant in real time.

eNlight being a Cloud, also has these features integrated in it. This is a primary requirement of a cloud platform; in case this problem is not addressed by any Cloud provider then it raises questions on their offerings.

3.5 DR Cost More Than The Primary Site

Information Technology has become the backbone of organizations around the world today. It is an integral part of the corporate operations at every level. In simple terms, we can safely say that businesses nowadays run on IT. Technology finds itself firmly rooted in every corner of an organization. As a result, the need to plan for potential disruptions to technology services has increased exponentially. It is a well known fact that the World Trade Center bombing in Manhattan in 1993 resulted in total failure of 150 out of 350 businesses operating out of the Trade Center-that is a whopping 42% failure rate. A collapse of such magnitude happened because these organizations didn't plan to overcome any disruptions in technology services or their businesses. Any kind of hazard like natural hazards, human-induced hazards, technological hazards or accidents can cause outage with serious impact on businesses. Therefore it is vital to have a Business Continuity Plan to survive a disaster. No company can afford to ignore the need for BC/DR planning, regardless of its size, revenue or number of staff. Some organizations cannot tolerate any downtime. These include

financial institutions, credit card processing companies, health care industry, banks and even some manufacturing companies. The statistics reflecting the failure rate of companies after a disaster are alarming and serve as a wakeup call for all IT professionals and corporate executives.

The crucial factors to be considered while designing a DRS are:

- Maximum Tolerable Downtime (MTD)
- Recovery Time Objective (RTO)
- Recovery Point Objective (RPO)

The cost of DR operations depends on the figure you want to achieve over the above mentioned points. Sometimes the cost of DR site and its operations are more than the main site.

Solution:

With eNlight DRaaS Service, users don't have to pay for the entire setup. Pay only for the disk space and server resources which are required to replicate the data from the main site. User just has to pay only when the disaster strikes and when the DR server is actually used. One DR site can take care of the replication of multiple Datacenters in different parts of the world. This DR site can be a set of servers on eNlight Public Cloud or with the users' eNlight Private Cloud. Initially the main site serves the request of the nearest users and as soon as there is a disaster, all users are automatically directed to the DR site, depending on the RTO requirement. When there is a demand for high resources, i.e. whenever all users start connecting to the DR server, the resources of servers at DR site auto-scale to satisfy the demands and similarly scale down when the demand decreases. As soon as the main site is online, the entire data is restored and users start connecting to the nearest location.

3.6 Provisioning & Management Of Services

After confirming an order from the customer, it normally takes minimum 12-24 hours for the server to get online and then additional time to install required software and configure them according to the users need. In a typical scenario where the client has additional software requirements, a server may take more than 48 hours to be usable.

Additionally not all datacenter provide a management portal to manage their servers. There are instances where it takes 2-3 hours for a server to get rebooted. Some datacenter also charge for these services. Users are left with no option but to pay and wait for the support to resolve their problem because of the insufficient control over their infrastructure.

Similar problems are also faced by Enterprise who has their own datacenter. They have to completely depend on their IT staff to make configuration changes. Most of the time there are no logs provided to calculate the response time from their IT staff and to have the provisioner have to pay heavily for the software.

Solution:

eNlight comes with a simple and user friendly Control Panel that can manage Clouds at different locations. eNlight facilitates the day to day management of servers, as it provides automation in order to simplify and smoothen the entire process. eNlight allows remote users to check the performance of their servers anytime

and from anywhere in the world. The web based console gives the freedom to access the server's activity without the restrictions of place and time.

Intuitive Control Panel of eNlight Cloud comes with following features:

- Choose servers located in India, UK and USA.
- Users can create, start, stop, restart and destroy their Virtual Machines across multiple Datacenters.
- Pre-Configured Linux and Windows Templates.
- Server with pre-installed software. This saves a lot of the time and cost.
- The other Available OS are:
 - Linux with Apache, MySQL, PHP
 - Linux with cPanel
 - Linux with Plesk
 - Windows 2008 Std / Datacenter
 - Windows 2008 Std IIS ASP MSSQL
 - Windows 2008 with Plesk
- Usage and amount utilized can be viewed in hourly, daily, monthly and yearly time span.
- Users can monitor CPU, bandwidth and RAM usage.

3.7 Backups Are Complicated

Backing up all the mission critical data is one of the most important things one can remember to do. Without a good backup option, chances are that one can lose out on all important data in case of any disaster / failure. However, a lot of efforts are involved to ensure that the backups are available whenever they are needed. Again to have it automated; one has to pay high cost for the software. But sometimes the software does not give the flexibility in prioritising the data as well as the best time to have it. Some backup applications eat up all the available RAM and CPU of the server just to backup the data. After all, there is still a manual intervene required to ensure that the backup has been properly taken. Most of the time services have to be shut down for an error free backup.

The restoration of backup is also time consuming & complicated. It may take from 24 hours to 4 days to restore a full backup of a server.

Solution:

eNlight comes with an option to take the snap shot of your VM in the current state. This can be a manual process or scheduled tasks without including any downtime. Since the snap shot is taken in live environment, there isn't any data loss or downtime. In case there is a major problem with the running VM, it can be easily restored with minimum downtime. The snapshots of VM are stored in a different fire protected zone to ensure the integrity of backups in case of fire. Users are free to decide the age of backup.

3.8 Security Of Data

Security of data is the major concerns for CIOs around the world today. Enterprises are ready to pay any cost to ensure the security of their data. A single loophole in IT infrastructure can cost in billions. There are more than a million threats on internet today and they are increasing every minute. However to protect the data

from every single threat it takes a lot of skills and \$\$\$\$. Sometimes even spending high over the security does not pay off, the data still remains exposed to vulnerabilities.

Solution:

Please go through the through the document “eNlight - Safe and Secure” under “Media & Resources” to understand how eNlight ensures high security.

3.9 Increasing Computation Is Increasing Carbon Foot Prints

In a world where political forces seem focussed on saving the world from either real or imaginary threats of global warming and climate change, corporations are pressurized to reduce their carbon footprint and the impact their activities have on the environment.

Solution:

eNlight Cloud offers tremendous benefits when best practices are used not only for the corporate bottom line but also for the conservation of the earth's resources. The "green" benefits are primarily twofold. First, virtualization reduces the amount of physical hardware needed to run an IT operation. From datacenters to enterprise servers, a single modern server can now run several virtual servers, sometimes with higher performance than they would have if each server was on its own hardware platform. This benefits the earth because less raw materials and electricity are used in the production process.

A lower number of total hardware units means less fossil fuel are needed to warehouse and transport server hardware. Finally, fewer hardware platforms in service mean that fewer machines end up in landfills where they take up space and potentially leak dangerous chemicals.

The other environmental advantage of eNlight comes in the form of reduced energy requirements. Especially with so-called "cap and trade" regulations being implemented by the government, energy costs are skyrocketing, making datacenters and IT divisions a flash point for runaway costs. Through virtualization, fewer hardware servers are required to support a growing number of virtualized servers, reducing overall energy consumption. Furthermore, servers optimized for virtualization are now commonplace, implementing the latest power management technology to reduce the environmental footprint of IT.

eNlight in form of virtualization is no longer an emerging technology. It is a mature and practical technology that substantially addresses corporate "green" requirements while aggressively reducing operating costs.

4. Conclusion

eNlight, the latest and most prominent entrant in the Cloud Hosting market addresses all your concerns around optimizing operating costs, managing perfect resource utilization, issues involved in upgrade or downgrade of hardware, coverage in case of disaster, ease of provisioning and management, ease of backups, data security etc. eNlight also ensures that you are doing your bit in maintaining balance between your IT infrastructure and the earth.

All ever-changing demands of IT infrastructure are being taken care of by eNlight, allowing you to focus on your business and grow your revenues, with eNlight providing a helping hand in saving you some expenses, resulting in an indirect addition to your revenues!!