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Optical Network Examiner

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ABSTRACT: The system offers a range of choices required for the network to operate correctly without interruptions. This method is used to conduct performance analytical status reviews for various networks so that the necessary identities can be recognized when analyzing planning. The system will offer numerous interactive dashboards with a variety of options for serving the network. Numerous network-related services need to be maintained, and for this, various tools are used depending on the requirements, such as storage, servers, security, report generation, etc. The adjustments needed for the analytical review are provided by customized variants, which aid in the provisional output.

KEYWORDS: Performance analytical status review, customized variants, Analytical review.

I. INTRODUCTION

The “Optical Network Examiner” is the centralized system with is utilized to perform various activities in the network. There will be numerous networks to maintain inside the business, therefore numerous tools, software, storage systems, servers, security measures, etc. are used. We have a lot of responsibilities, and the current system makes it difficult to manage them all because various tools and software are needed. A variety of storing instruments are needed to maintain the storage system. The organization needs a lot of tools because networks are complex. If so many tools are needed, the cost to that company will be high.

Only one tool will be used because of the way the centralized system is set up. We can control several tasks with that one tool. Any network-related tasks may be managed from this centralized system, so anyone who wants to perform network analysis, view performance analysis, or store networks can do so. Numerous analytical reports are generated here, and integrations are possible.

II. LITERATURE SURVEY

EXISTING SYSTEM

We have a reference to the assembly of real-time data in the current system, but it is quite challenging to take data in a variety of scenarios. For the creation of reports, analysis, virtualization, security identification, etc., we have a separate tool. It becomes more challenging for the organization to achieve the necessary oversight and regulation when different instruments are used for different tasks.

There will be numerous networks to manage inside the organization, so various tools, software, etc. are used. The main issue with the current system is that handling all of these network-related tasks requires a variety of tools and software that will be expensive for that organization. This particular company has a lot of things to manage. For instance, certain tools are required to maintain the storage system. If there are mistakes, problems, or a security breach, we will need to investigate the problem again using a different set of technologies. The company needs a lot of tools to maintain the network because it is intricate.

The main drawback of the current system is that there is no centralized platform or dashboard for the organization to undertake various tasks and related performance status analysis and review.

To monitor the various references, several commands are needed, which is quite challenging for a single system to manage and for ongoing monitoring.

PROPOSED SYSTEM

In the suggested system, all network-related tasks may be completed with ease and the system is intended to be designed as a centralized system with controlled supervision in a single system. This suggested solution includes a range of services that will make network maintenance simple for the organization. By making the various teams within the organization easily accessible, it helps to provide the service. Numerous types of scenarios are included in the suggested method, which will assist in helping people organize their work according to their needs.

If network analysis is desired, performance analysis, network storage, and all of these operations can be handled by that one tool in a single system. This centralized system will control all network-related operations. The organization will maintain all network-related items in one location.

The following are a few benefits of the suggested system that are taken into account:

- Any organization using this system will be given access to a dashboard. If a user uses the dashboard, it will present them with a number of alternatives; it is up to them to decide how they will utilize it.
- The dashboard covers many functions such as storage, website performance, servers, business, custom metrics, virtualization, reporting, issue tracking, etc. The dashboard will be customized with the settings.
- When one of the many types of reports is generated by this system, the user must specify the range within which they want the report to be generated.
- Whatever information or reports are produced, that is real-time conversion.

III. TECHNOLOGY

PYTHON

Python is an extremely popular programming language among developers and data scientists since it is strong and versatile. It was made by Guido van Rossum and was initially made available in 1991. Python is a great option for both inexperienced and expert programmers since it places an emphasis on readability and simplicity.

Python is an interpreted language, which means that commands are carried out line by line as opposed to being first compiled into machine code and then performed. This makes Python very interactive and enables quick testing and development. Additionally, it provides cross-platform compatibility, enabling Python code to execute unaltered on other operating systems the language's widespread use is also a result of its priority placement on maintainability and readability of code. The Zen of Python, a tenet upheld by the Python community, emphasizes the value of simplicity, clarity, and explicitness in coding. Because of the culture of clear and organized code that has been cultivated by this concept, Python projects have become simpler to comprehend and keep up over time.

Overall, Python has become one of the most commonly used programming languages across a variety of areas, from web development and scientific computing to machine learning and automation, because to its mix of readability, simplicity, versatility, and a rich ecosystem of libraries.

DJANGO

Python-based Django is a high-level web framework that makes it easier to create web applications. It was created to encourage DRY (Don't Repeat Yourself) coding, clean design, and quick development. Due to its particular implementation, Django is frequently referred to as a Model-View-Template (MVT) framework even though it adheres to the Model-View-Controller (MVC) architectural pattern. Django has a thriving and helpful community, which helps to explain the variety of third-party packages and plugins it offers. It adheres to the open-source principle by being openly accessible and getting regular updates from the public.

The Django ecosystem benefits from a thriving and active community that offers a wide range of third-party resources, tutorials, and packages. It adheres to the "batteries included" tenet and offers a wealth of out-of-the-box capabilities that speed up development and encourage code reuse. Django's reliability, wide range of features, and focus on clean, maintainable code enables developers to create sophisticated web applications fast and effectively.

ALGORITHMS USED

RSA Algorithm

The Rivest, Shamir, and Adleman (or RSA) algorithm is a well-known public-key encryption scheme. It bears the names of Rivest, Shamir, and Adleman, its creators. The difficulty of factoring big integers into their prime factors is the foundation of the RSA method.

The difficulty of factoring huge integers into their prime factors is the foundation for the security of the RSA method. The more bits in the prime numbers p and q , or the key size, the more difficult it is to factorize the modulus n and decrypt the data. Therefore, for safe transmission, RSA normally employs key length of 2048 bits or more.

It's crucial to remember that RSA encryption, despite its widespread use, can be computationally expensive for big messages. A quicker symmetric encryption technique, such as AES, is then employed to encrypt the actual message. As a result, in actual practice, RSA is frequently used to encrypt a symmetric encryption key. This hybrid strategy combines secure key exchange with symmetric encryption's effectiveness.

SHA Algorithm

The National Institute of Standards and Technology (NIST) in the United States has released the family of cryptographic hash functions known as the SHA (Secure Hash Algorithm). The NSA created them. To guarantee data integrity and confirm message authenticity, the SHA algorithms are widely employed in many cryptographic applications and protocols.

The SHA algorithm has several iterations, including SHA-1, SHA-224, SHA-256, SHA-384, and SHA-512, each of which generates hash values with varied lengths. Higher security levels and longer hash computation times are associated with longer output lengths.

The resulting message digest can be used for a variety of tasks, such as confirming the accuracy of data, password hashing, creating digital signatures, and more. It is commonly expressed as a hexadecimal or binary value. The message digest should differ dramatically even from a slight change in the input message.

It's crucial to remember that the once-commonly utilized SHA-1 algorithm is now regarded as insecure due to flaws found in its collision resistance. For greater security, the SHA-2 family of algorithms (SHA-224, SHA-256, SHA-384, and SHA-512) or the more current SHA-3 algorithm should be used.

SSL Algorithm

The deprecated cryptographic protocol SSL (Secure Sockets Layer) was employed to protect network communication between a client and a server. It has been replaced with the more recent TLS (Transport Layer Security) protocol, also known as "SSL" informally.

SSL/TLS uses a number of cryptographic methods, including key exchange, encryption, and message authentication, even though it is not an algorithm in and of itself.

Versions of SSL/TLS that are supported include SSL 3.0, TLS 1.0, TLS 1.1, TLS 1.2, and TLS 1.3. Different security measures and enhancements are available in each version. It's vital to remember that more recent, more secure versions should always be used instead of outdated ones like SSL 3.0 and early TLS versions because they contain known security flaws.

To enable secure communication, confidentiality, integrity, and authenticity between clients and servers on the Internet, SSL/TLS integrates various cryptographic methods and protocols.



IV. EXPERIMENTAL RESULTS

ADMIN LOGIN PAGE

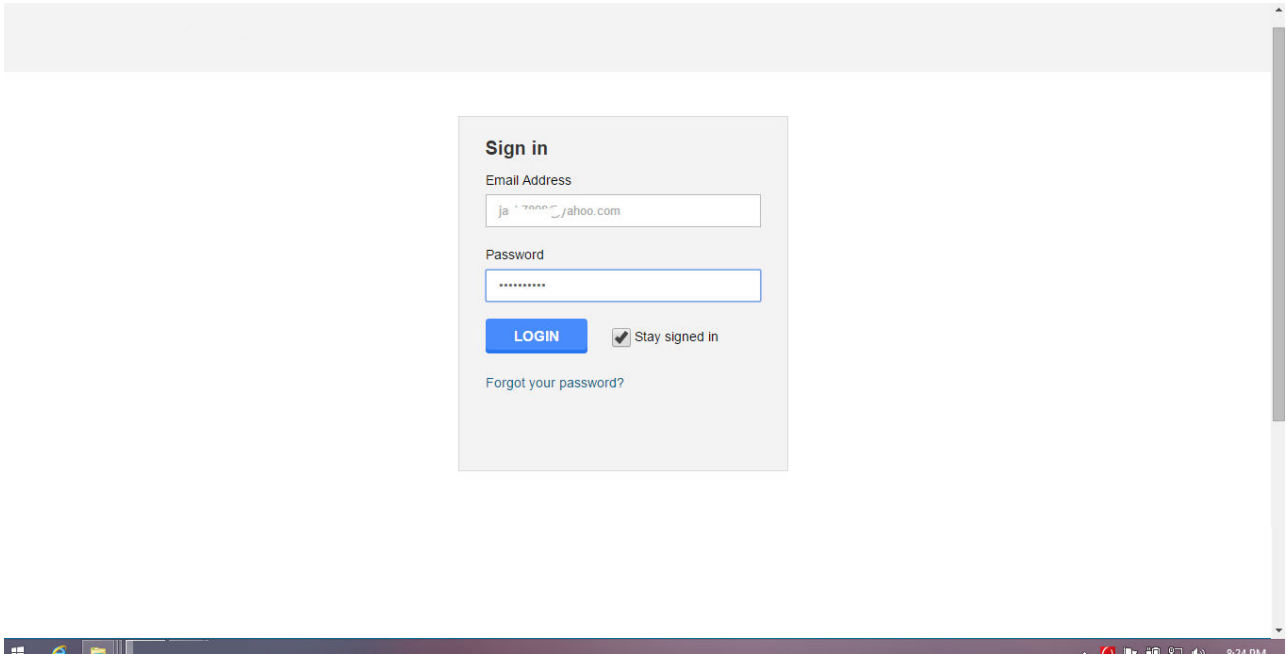


Figure 1 : Admin Login page

The above page shows the Admin login page, where the admin can log in to the system using an email address and respected password. Then the admins are accessed to use the system.

DASHBOARD

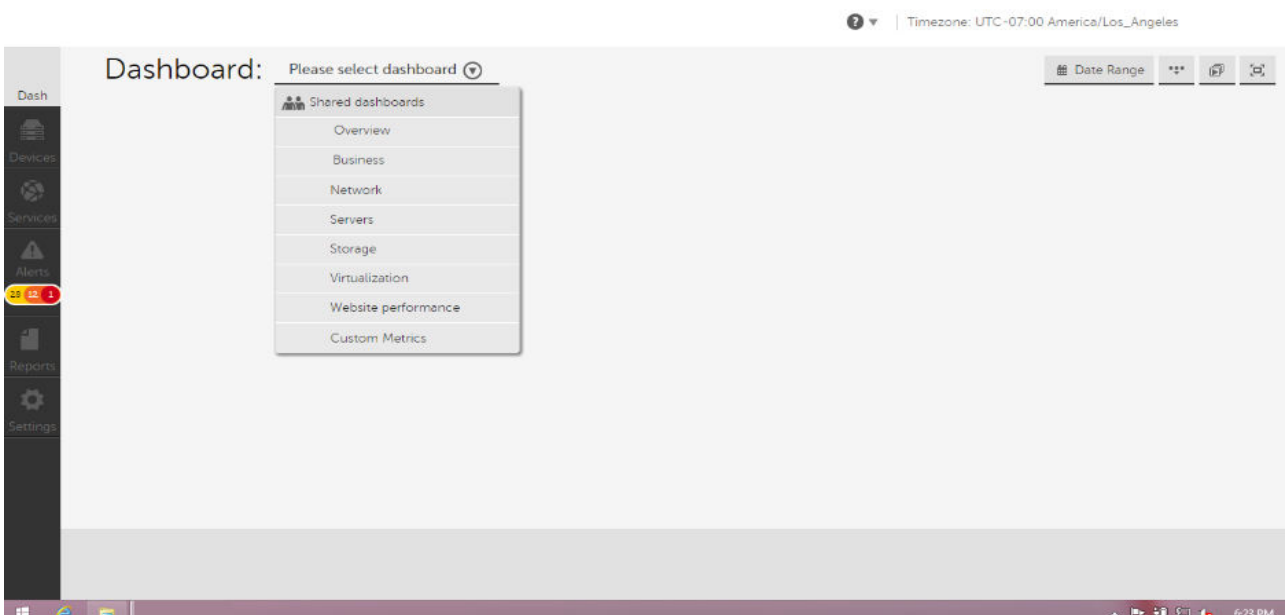


Figure 2 : Multiple dashboards for selection

When admin logs into the system the above page will displayed. Through this admin can select whatever requirement is needed. Shared dashboard is also available.



REPORT GENERATION

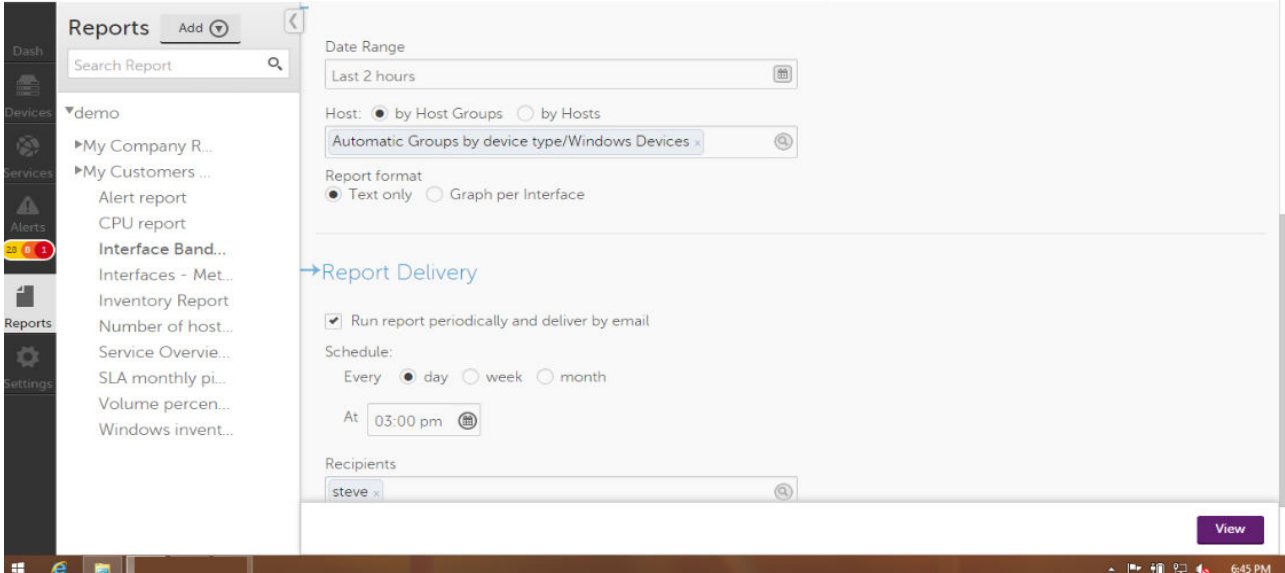


Figure 3: Report generation

The above page shows the generation of report when we select reports in the dashboard. The report will be generated automatically if you gave the date and time to the system and it will deliver the report. And we can customize those report according to our needs.

THE GENERATED REPORT

COMPANY demo

DESCRIPTION

Server CPU Usage report

HOST	Min(%)	Max(%)	Average(%)
Vendor	28.05	47.51	32.66
ESX Host 3	28.59	48.19	32.49
ESX Host 3	21.21	28.06	23.57
Vendor	20.81	27.35	23.53
Win2012-2	8.25	22.04	15.12
ESX VM - Win 2008 R2 - Exchange, IIS, MSSQL, UNC	9.76	37.67	11.16
Vendor	8.48	14.65	10.46
Vendor	8.82	11.80	10.14
Vendor	3.42	12.58	6.00
ESX Host 2	3.41	12.70	5.98
Vendor	4.56	10.37	5.86
Domain Controller - Win 2008 R2 - AD, DNS, IIS, WinDC, UNC	1.70	7.95	2.88
Vendor	1.55	4.15	2.35
ESX VM - Win 2008 R2 - Exchange, IIS	1.01	19.99	1.34
Win2012-1	0.42	47.41	1.34
Hype-V	0.59	2.42	0.82

Figure 4 : Generated report

This above page shows the generated report of the CPU. In various report options if we select the CPU report it will show the work done by CPU from the days or time we selected.



V. CONCLUSION

We can draw the conclusion that only one system can offer reputable organizations all types of services. It will offer the customer a wide range of alternatives with services like alarms, report generation, different report options for the generation, custom metrics for the customization, services, storage, network overview, virtualization, website performance, and business like this. It is quite useful to be able to handle all jobs independently using a single system that is simple to use. The system uses customized variations to associate the task appropriately. Customized variants help for the provisional output by providing the adjustments required for the analytical review. With the aid of graphics, the auditing reports are examined. In conclusion, this system can be used to fulfill any requirements needed for any service.

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