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СВОЙСТВА ИЗМЕНЕННЫХ ФУЛЛЕРИТА ДЛЯ ОРГАНИЧЕСКИХ ФОТО ЧУВСТВИТЕЛЬНЫХ УСТРОЙСТВ

Измененные фуллерита C_{mn} были изготовлены путем нерадиационного облучения и озонирования C_{60} в гелевом растворе. Экспериментальные исследования были проведены в ультрафиолетовом, видимом, инфракрасном диапазонах спектров рамановской спектроскопии, XPS и АСМ. Структуры измененных C_{mn} в гелевом растворе (агрегаты с гидратированными связями) изучались. Я представляю результаты от первоначального выбора образцов, основываясь на информации о ихквантовой структуре и сопутствующих свойствах, их сравнение с результатами вычисления плотности функционала в теории для эффективности фотоэлектрического устройства на эффекте акцепторных – донорной архитектуры. Сравнение спектральных особенностей измененных C_{mn} данным для адсорбированных слоев позволило выявить серии гидроксильных групп в измененных C_{mn}.

Ключевые слова: фуллериты C_{mn}, фулерол, гидроксилы-, епоксил-, кето-изменения, электронная структура, увеличеное поверхностное инфракрасное поглощение.

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OPTIMIZIATION WEB-APPLICATIONS WITHOUT USERS GENERATED CONTENT FOR RELIABILITY AND PERFORMANCE USING NGINX TECHNOLOGY

The paper is considered to approach to develop reliable and productive web-application. Contradiction between performance, achieved by building system from different, dedicated to one task, nodes, and reliability is analyzed. Proposed technical solution based on nginx that eliminates the contradiction.

Keywords: web-applications, reliability, performance, nginx.

Introduction. Recently there has been continued growth in both the number of online users and Web applications (sites, services, social networks) [1] The growing number of users requires a web application a significant increase in performance due to the fact that the process visits to web resources has a random nature with significant fluctuations. And customer service even visiting peaks should occur at the time of the order of 1–2 seconds [7]. At the same time the web application requires reliability, so even 15 minutes disability sites lead to a significant reduction of its position in Google SERP [6].

So actual is the problem of building Web applications that have improved reliability and performance simultaneously. But these IT requirements are often those that contradict each other. This contradiction occurs because that productivity is generally associated with parallel operation. This parallel operation requires some parts of specialization that prevents duplication of their work to ensure reliability.

Implementation. In this paper we propose a technical solution that is optimal in terms of reliability and performance. As the criteria of reliability, we used a disability, as well as performance criteria – the number of components that can perform the work at once.

To construct the solution we used technology nginx [4]. Nginx is a free, open-source, high-performance HTTP server and reverse proxy. Nginx was started in 2002, with the first public release in 2004. Nginx now hosts nearly 12.18% (22.2M) of active sites across all domains. Nginx is known for its high performance, stability, rich feature set, simple configuration, and low resource consumption. [5] Scheme of the standard Nginx configuration shown in Fig.1.

As can be seen from the scheme in the standard technology Nginx configuration ensures reliable operation in the case of a single server. However, any server can fail for a number of reasons such as hardware or software failure, network failure, or even problems with the electricity in the data center.

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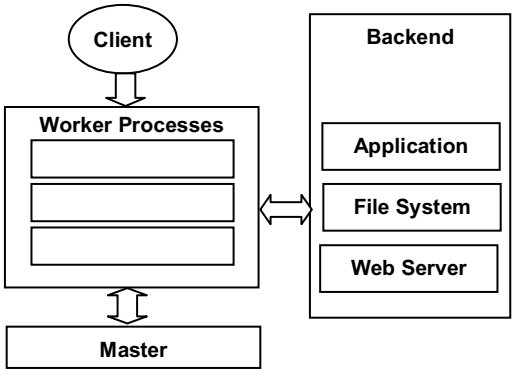

Fig. 1. Scheme of Nginx

The standard way to improve the reliability of system works is mirroring servers, and the reserve server can be located even in a different data center. In case of failure of one server it is possible to switch to another. However, the use of reserve systems can not improve the performance of the system as a whole, as the work performed by one anyway. To improve performance main and reserve servers have to serve clients simultaneously. It is clear, that in the case where users generate the content this architecture become complex because it requires synchronization of content between servers when the user change it. But there are a number of services, such as [3], where it is not necessary to modify the stored content in response to the user actions. The proposed solution is designed for these systems. The main idea of solution is to create mirrored copies of the service, access to which is performed under round robin, implemented by domain name system service [2]. Scheme of the round robin is shown in Fig. 2.

The main problem of this solution is that it requires storing complete copy of the data on all used servers and therefore takes up more memory than the parallel operation of specialized copies. As the solution of this problem it is proposed to use natural feature of database cache – keeping in memory the data that are used more commonly. But in order to work, data used to serve client's request has to hit the cache in the server. So, on every server users requests have to be limited to some subset, of

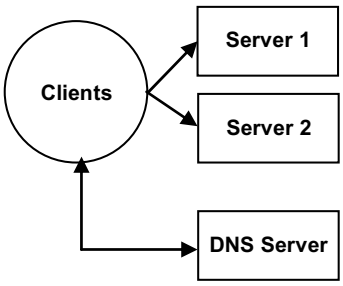

Fig. 2. Scheme of the round robin

all requests, and every server handles it's own part. To implement this mechanism it is proposed to use Nginx server. It is flexible enough to define by configuration how to distribute requests to servers to make cache effective. Also in case of failure of one of them, requests are handled by working servers. This detection efficiency of the server is done automatically by analyzing the responses. The general scheme of the proposed solution is shown in Fig. 3. Example of Nginx configuration is shown below.

```
upstream application_application {
        server 127.0.0.1:8090;}
upstream local_application {
        #prefer local application over remote
        server 127.0.0.1:81;
        server server_2:81 backup;}
upstream remote_application {
        #prefer remote application over local
        server server_2:81;
        server 127.0.0.1:81 backup;}
server {
        listen 81;
        location / {
        proxy_set_header Host $host;
        proxy_pass http://application_upstream;}
}
server {
        #handle client's requests
        listen 80;
        server_name server_1;
        location / {
        #query classification.
        if ($arg_query !~* "^[0-9a-n]") {
                proxy_pass http://remote_application
                break;}
        if ($arg_query ~* "^[0-9a-n]") {
                proxy_pass http://local_application;
                break;}}}
```

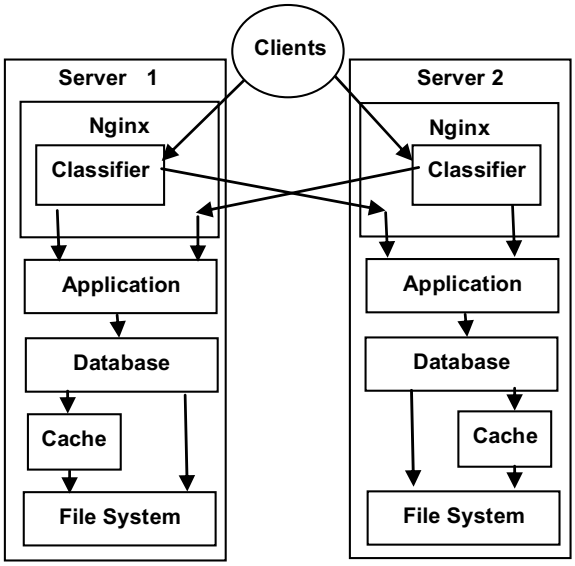

Fig. 3. The proposed solution in general

Conclusions. The proposed solution can improve overall system performance by parallelizing work on several servers and effectively using resources of all processors and of total memory of all servers. Also it increases reliability of all system. On failure of a server response time increases, but overall the service keeps running smoothly.

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ОПТИМІЗАЦІЯ ВЕБ-ДОДАТКИ ЗА НАДІЙНІСТЮ ТА ПРОДУКТИВНІСТЮ З ВИКОРИСТАННЯМ NGINX ТЕХНОЛОГІЇ У ВИПАДКУ ВІДСУТНОСТІ КОНТЕНТУ, ЩО ГЕНЕРУЄТЬСЯ КОРИСТУВАЧАМИ

У статті розглянуто підхід до побудови відмовостійкого та продуктивного веб-застосунку. Розглянуто протиріччя між продуктивністю, яка досягається за рахунок спеціалізації вузлів системи, та надійністю системи. Запропоновано технічне рішення на основі nginx, яке знімає це протиріччя.

Ключові слова: веб-застосунки, надійність, продуктивність, nginx.

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ОПТИМИЗАЦИЯ ВЕБ-ПРИЛОЖЕНИЙ ПО НАДЁЖНОСТИ И БЫСТРОДЕСТВИЮ С ИСПОЛЬЗОВАНИЕМ ТЕХНОЛОГИИ NGINX В СЛУЧАЕ ОТСУТСТВИЯ ГЕНЕРИРУЕМОГО ПОЛЬЗОВАТЕЛЯМИ КОНТЕНТА

В статье рассмотрен подход к построению отказоустойчивых и производительных веб-приложений. Рассмотрено противоречие между производительностью, достигнутую за счет специализации узлов и надёжностью системы. Предложено техническое решение на основе nginx, которое снимает противоречие.

Ключевые слова: веб-приложения, надёжность, производительность, nginx