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An Effective Scheme of Identifying and Allocating Resources for Transactions in Windows Azure

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Abstract - Creating an infrastructure using Windows Azure dynamically allocates the resources. The web roles and worker roles are created to execute the given task based on the machine capabilities. Web roles are the user interfaces that the real world users can see and submit their operations while processing the requested jobs. Worker roles are background processes that can do some work. The hypervisor will find the resources to process the request from the queue and performs the job and marks the flag in the queue. Round Robin scheduling algorithm with time quantum assigned for each job will improve the QoS. The Windows Azure Storage has tables where the uploaded messages and image hash values will be stored, the queues will be created whenever user is submitting the image in the web role, and this queue will be processed by the Worker role and the blobs will have the uploaded images stored in the containers.

Index Terms: Web roles, Worker roles, Windows Azure Storage, Round Robin scheduling.

Terms and Abbreviations –
WAS Windows Azure Storage is a scalable cloud storage system that is used inside Microsoft for applications such as social networking search, serving video, music and game content, managing medical records.

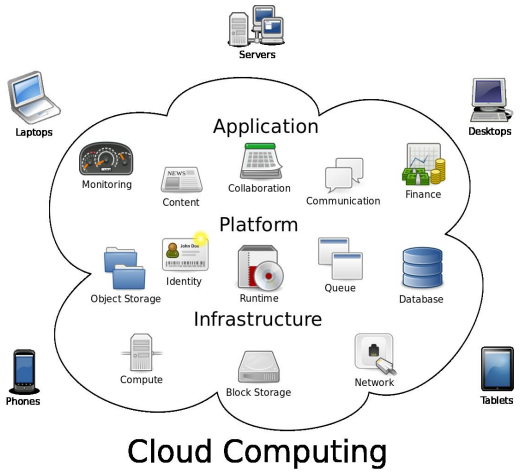
Web roles are the user interfaces that the real world users can see and submit their operations while processing the requested jobs.

Worker roles are background processes that can do some useful work.

I. INTRODUCTION

Cloud enables convenient, on-demand network access to shared pool of configurable computing resources that can be provisioned and released with minimal management effort or service provider interaction. Cloud is any-time, any-where available and reliable.

The characteristics of cloud computing includes on-demand self-service, ubiquitous network access, location-independent resource pooling, rapid elasticity, and measured service, all of which are geared toward using clouds seamlessly and transparently. Rapid elasticity lets us quickly scale up resources. Measured services are primarily derived from business model properties and indicate that cloud service providers control and optimize the use of computing resources through automated resource allocation, load balancing, and metering tools. Cloud computing does not involve any significant capital expenditure for the organization. In some sense cloud computing involves renting the computing resources instead of buying them.



Cloud Computing

Windows Azure is a cloud computing platform and infrastructure, created by Microsoft, for building, deploying and managing applications and services through a global network of Microsoft-managed datacenters. Windows Azure is used to build web applications, and to create virtual machines for

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development and test or to run SharePoint and other applications. It provides both platform as a service (PaaS) and infrastructure as a service (IaaS) services and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems.

Windows Azure offers several Internet-accessible application services running in Microsoft datacenters. The major services are, Execution model, Data management model, Networking model, Business analytics model, Messaging model.

II. PROPOSED SYSTEM

To identity the efficient systems in the cloud environment to execute the given task, based on the machine capabilities. Web roles (Web roles are web applications hosted in IIS) are the user interfaces that the real world users can see and submit their operations while processing the requested jobs. Worker roles are background processes that can do some work (i.e. a chat application with image upload support that automatically compress the uploaded images in order to fit into the browser). The Windows Azure Storage (WAS) has tables, queues and blobs, where the uploaded messages and image hash values will be stored, the queues will be created whenever user is submitting the image in the web role, and this queue will be processed by the Worker role and the blobs will have the uploaded images stored here.

Creating an infrastructure using Windows Azure using the web roles and worker roles to execute the given task solves the dynamic resource allocation. To emulate the cloud using azure reduces the memory consumed from the resource sharing in cloud. To improve the scalability and availability we use to process the job in message queues.

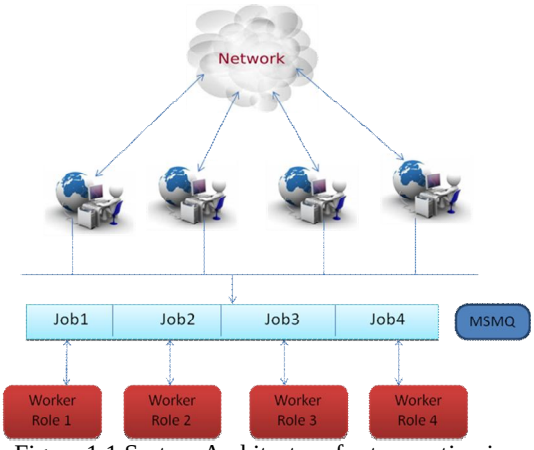

Figure 1.1 System Architecture for transaction in Azure

The system architecture is the conceptual design that defines the structure or behavior of the system. Architecture is a formal description of a system. It defines the system components or building blocks and provides a plan from which products can be procured, and systems developed, that will work together to implement the overall system. The web roles are user interfaces, which gets the input from browsers localhost. The jobs are put into the queue and executed in a round robin fashion.

III. MODULES WITH DESCRIPTION

Web and Worker Roles creation

In this module, Web and Worker roles will be created for submitting the request and processing the job (e.g., image resizing to thumb nail).

- Web Roles are the client interface which are constructed (web interface), to be accessible from the client side.
- Worker Roles are the background process, which will run on the background to process the job.

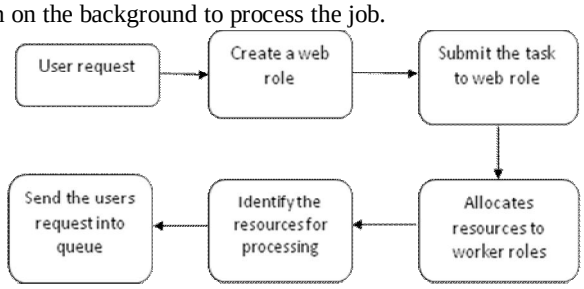

Figure 3.1 Flow diagram for web and worker role creation

Queue processing

In this module, the queues will be constructed based on the input request, Each and every request will be stored in the queue, The Average expected time for the queue processing is 10 seconds for every job, during the processing of the current job the flag, there will be a flag indicated that the current job is executed .

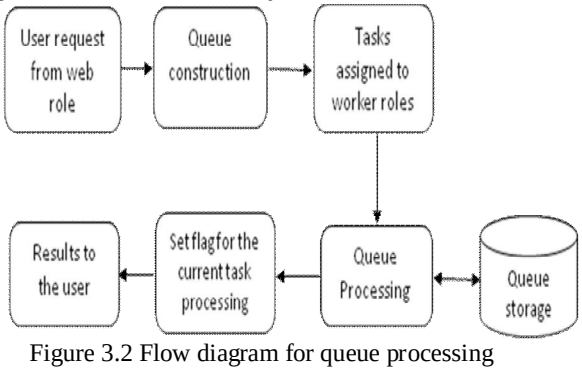

Figure 3.2 Flow diagram for queue processing

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C. Hypervisor Simulation

In this module, we simulate the creation of hypervisor, which is the Windows Azure Operating system which will handle the processes like, Managing the server states, Creation of geo replication, Creating the dynamic creation of worker / web roles based on the configuration file.

D. Virtual Machines And Dynamic Assignment of Resources

In this module, the tasks will be created like resizing the file / requesting the files, at this juncture the hypervisor will find the resources to process the request from the queue and performs the job and marks the flag in the queue.

IV. RELATED WORK

The Round-Robin scheduling algorithm is used for dynamic scheduling.

A. ROUND ROBIN SCHEDULING ALGORITHM

The round-robin (RR) scheduling algorithm is designed especially for time-sharing systems. It is similar to FCFS scheduling, but pre-emption is added to switch between processes. A small unit of time, called a time quantum or time slice, is defined. A time quantum is generally from 10 to 100 milliseconds. The ready queue is treated as a circular queue.

Algorithm

let (time) quantum be 2 (sec.) ---time slice

if countQueue(CPUQUEUE) equals 1 THEN --- is a process (tran) running ?
if headqueue[CPUQUEUE] PCB_run equals 0 THEN --- process has completed
take process off CPU
if countQueue(READYQUEUE) greater than 0 THEN
issue_process onto CPU
decrement time quantum counter
else --- process has not completed
if headqueue[CPUQUEUE] time quantum equals 0 THEN -time's up!
if countQueue(READYQUEUE) greater than 0 THEN
remove process from CPUQ and insert into READYQUEUE
reset time quantum counter
issue next available process onto CPUQ
decrement time quantum counter
else ----no processes (trans) in ready queue
reset time quantum counter
run for a tick
decrement time quantum counter
else ---quantum has not expired
run for a tick
decrement time quantum counter
else ---CPU is idle
if (countQueue(READYQUEUE) greater than 0 THEN
issue process onto CPU
decrement time quantum counter
end_if
end_if
end_if
end_if
end_if
end

B. TECHNIQUE

MICROSOFT MESSAGE QUEUEING

MSMQ is a messaging protocol that allows applications running on separate servers/processes to communicate in a failsafe manner. A queue is a temporary storage location from which messages can be sent and received reliably, as and when conditions permit. Queues are used to receive and send the Messages.

V. CONLUSION

It identifies and allocates the resources for uploading the image of variant size with web and worker roles. The image is resized in-order to fit into the browser display. The azure storage is updated for every image upload with the timestamp and hash key values. This improves the efficiency and storage at minimal cost. In future, extending this work with multiple user access and global storage improves the availability, scalability.

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