**Adaptive Resource Management for Analyzing Video Streams from Globally Distributed Network Cameras**

**Abstract**

There has been tremendous growth in the amount of visual data available on the Internet in recent years. One type of visual data of particular interest is produced by network cameras providing real-time views. Millions of network cameras around the world continuously stream data to viewers connected to the Internet. This data may be used by a wide variety of applications such as enhancing public safety, urban planning, emergency response, and traffic management which are computationally intensive. Analyzing this data requires significant amounts of computational resources. Cloud computing can be a preferred solution for meeting the resource requirements for analyzing these data. There are many options when selecting cloud instances (amounts of memory, number of cores, locations, etc.). Inefficient provisioning of cloud resources may become costly in pay-per-use cloud computing. This paper presents a method to select cloud instances in order to meet the performance requirements for visual data analysis at a lower cost. We measure the frame rates when analyzing the data using different computer vision methods and model the relationships between frame rates and resource utilizations. We formulate the problem of managing cloud resources as a Variable Size Bin Packing Problem and use a heuristic solution. Experiments using Amazon EC2 validate the model and demonstrate that the proposed solution can reduce the cost up to 62% while meeting the performance requirements.

**Existing System:**

There has been tremendous growth in the amount of visual data available on the Internet in recent years. One type of visual data of particular interest is produced by network cameras providing real-time views. Millions of network cameras around the world continuously stream data to viewers connected to the Internet. This data may be used by a wide variety of applications such as enhancing public safety, urban planning, emergency response, and traffic management which are computationally intensive. Analyzing this data requires significant amounts of computational resources. Cloud computing can be a preferred solution for meeting the resource requirements for analyzing these data. There are many options when selecting cloud instances (amounts of memory, number of cores, locations, etc.). Inefficient provisioning of cloud resources may become costly in pay-per-use cloud computing.

**Proposed System:**

This paper presents a method to select cloud instances in order to meet the performance requirements for visual data analysis at a lower cost. We measure the frame rates when analyzing the data using different computer vision methods and model the relationships between frame rates and resource utilizations. We formulate the problem of managing cloud resources as a Variable Size Bin Packing Problem and use a heuristic solution. Experiments using Amazon EC2 validate the model and demonstrate that the proposed solution can reduce the cost up to 62% while meeting the performance requirements.

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Intel Dual Core.
* Hard Disk : 120 GB.
* Ram : 1GB.

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows 7.
* Coding Language : JAVA/J2EE
* Tool : Netbeans 8.1
* Database : MYSQL

**CONCLUSION**

This paper presents ARMVAC, an adaptive resource manager to select low-cost cloud instances for analyzing MJPEG data from globally distributed network cameras. Inputs to ARMVAC are the analysis programs, the required number of cameras, the locations of the cameras, the target frame rates, and the durations of the analyses. The outputs are the types, locations, and number of cloud instances to be launched to achieve the target frame rate on all the cameras. ARMVAC includes a model to predict the maximum number of streams that can be analyzed on different types of instances. We evaluate ARMVAC using Amazon EC2 cloud instances and observe that the achieved frame rate on all cameras is equal to the target frame rate for different input scenarios thereby satisfying the performance requirements. We observe that ARMVAC lowers the overall cost up to 62% when compared with four other reasonable strategies (ST1 - ST4) for selecting cloud configurations. Our evaluation demonstrates that our method is not ad-hoc and can be applied to different analysis programs.

As part of our future work, we will extend the method to handle analysis programs which are memory intensive, bandwidth intensive, or I/O intensive. We would also like to improve our method of adaptively launching instances while adjusting to the run-time conditions. We also plan to study effect of adaptive nature of H.264 streams on resource selection.

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