Information Technology

New Framework Helps Compose and Scale Middlebox Software Modules for Cloud Computing

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing Stratos, a framework that recognizes middleboxes as first-class entities and enables cloud users to easily optimize their usage.

Overview

Cloud computing is an emerging model for the delivery and consumption of information technology (IT) resources. Infrastructure-as-a-service cloud providers deliver virtual servers along with network connectivity and storage on demand. The providers automatically provision these resources as they are requested by end users. The end users may leverage virtual servers from third-party vendors, in-house data centers or a combination of the two to meet their IT needs.

As end users deploy applications on these virtual servers, they also frequently need to deploy important supporting services within the networks to ensure the security and performance of the applications. These supporting services are hardware or software modules, called middleboxes, which examine and modify network traffic. Examples include firewalls, load balancers and duplication elimination systems.

Including middleboxes in today's infrastructure-as-a-service clouds is extremely challenging due to a lack of support, vulnerability to overload and suboptimal placement. Existing technologies require complex, labor intensive redesigns to secure and optimize performance.

The Invention

UW–Madison researchers have developed a new methodology for managing these challenges. Called Stratos, the framework recognizes middleboxes as first-class entities in cloud infrastructures – centralizing and automating configuration, management, scaling and placement of middleboxes – empowering end users to easily secure and optimize their applications.

Applications

- Software offered to consumers by cloud providers and IT vendors

Key Benefits

- Deployable in today's clouds
- Stratos could be offered as an additional service without requiring changes to existing network infrastructure.
- Allows easy composition and data rebalancing between middleboxes.
- Controls data transport and computation in an efficient and intelligent manner.
- Low overhead

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- Helps cloud users meet application service level agreements (SLAs)

Stage of Development

The development of this technology was supported by WARF Accelerator. WARF Accelerator selects WARF's most commercially promising technologies and provides expert assistance and funding to enable achievement of commercially significant milestones. WARF believes that these technologies are especially attractive opportunities for licensing.

Additional Information

For More Information About the Inventors

- Srinivasa Akella

Publications

- Gember A., Grandl R., Anand A., Benson T. and Akella A. 2012. Stratos: Virtual Middleboxes as First-Class Entities. University of Wisconsin-Madison Department of Computer Science, TR1771.
- Gember A., Prabhu P., Ghadiyali Z. and Akella A. 2012. Toward Software-Defined Middlebox Networking. HotNets-XI, Seattle, WA.

Tech Fields

- Information Technology : Networking & telecommunications

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842