



## Middlebox Scaling for the Cloud

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**WARF: P150073US01**

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in implementing flexible and effective scaling of middlebox functions in cloud computing systems.**

### Overview

As data is shuffled around in computer networks, important components called middleboxes (also called network functions or NFs) examine and modify network traffic to meet security requirements, performance objectives and other goals. Middleboxes include firewalls, network address translators, caching proxies, etc.

Middlebox functions can be implemented in cloud computing systems, which allocate resources on demand to achieve significant economy of scale. However, unlike other processes, it is difficult to scale middlebox functions in a way that is both fast and accurate.

### The Invention

UW-Madison researchers have developed a method that efficiently adjusts the number of middleboxes on demand by transferring not only the flows of instructions but their related middlebox states as well. A new transfer process prevents the loss of data packets and preserves order.

### Applications

- Network virtualization software for cloud, enterprise and service providers

### Key Benefits

- Rapid scaling
- Loss-free and order-preserving algorithm guaranteed.
- Method satisfies service level agreements.
- No other solution can handle these problems without sacrificing speed and performance.

### Stage of Development

The researchers have deployed a full-feature prototype, which has been demonstrated at Nokia-MarketLink and at NFV World Congress.

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.

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Additional Information

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#### For More Information About the Inventors

- [Srinivasa Akella](#)

#### Related Technologies

- [WARF reference number P120286US01 describes a framework called Stratos that recognizes middleboxes as first-class entities in cloud infrastructures to help end users secure and optimize their applications.](#)

#### Tech Fields

- [Information Technology : Computing methods, software & machine learning](#)
- [Information Technology : Networking & telecommunications](#)

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