Communiqués de presse

Une avancée majeure, une mise en réseau élastique entre Clouds, dévoilée par AT&T, IBM Research et ACS

Financé par le programme CORONET de DARPA, le nouveau prototype permet de réduire de quelques jours à quelques secondes le temps de mise en place d'un réseau haut débit entre Clouds

Paris - 25 août 2014: Des chercheurs d'AT&T, d'IBM et de l'Applied Communication Sciences (ACS) annoncent aujourd'hui une technologie qui réduit la durée de la connectivité entre Clouds de quelques jours à quelques secondes. Cette découverte représente une avancée majeure qui pourrait un jour conduire à un temps de provisionnement inférieur à la seconde grâce à des équipements IP et de réseau optique de nouvelle génération. Elle permet une bande passante élastique entre les Clouds ayant des demandes de connexion élevées en utilisant des orchestrateurs de Cloud intelligents, et ceci au lieu d'avoir un provisionnement statique lors des pics de demande.

Le prototype a été réalisé grâce à la contribution et à l'expertise de AT&T, IBM et ACS. Ces recherches ont par ailleurs été effectuées dans le cadre du programme DARPA CORONET du gouvernement américain, qui met l'accent sur la reconfiguration rapide des réseaux térabits.

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Breakthrough Elastic Cloud-to Cloud Networking Unveiled by AT&T, IBM Research and ACS

Funded by DARPA’s CORONET program, the new prototype drastically reduces time to set up a cloud-to-cloud high-speed network through a service provider from days into seconds

DALLAS, Texas, YORKTOWN HEIGHTS, N.Y. and BASKING RIDGE, New Jersey - 29 Jul 2014: Scientists from AT&T, IBM (NYSE: IBM) and Applied Communication Sciences (ACS) announced a proof-of-concept technology that reduces set up times for cloud-to-cloud connectivity from days to seconds. This advance is a major step forward that could one day lead to sub-second provisioning time with IP and next generation optical networking equipment and enables elastic bandwidth between clouds at high connection request rates using intelligentcloud data center orchestrators, instead of requiring static provisioning for peak demand.

The prototype was built with contributions and expertise from AT&T, IBM and ACS, and the work was performed under the auspices of the U.S. Government’s DARPA CORONET program, which focuses on rapid reconfiguration

of terabit networks.

“The program was visionary in anticipating the convergence of cloud computing and networking, and in setting aggressive requirements for network performance in support of cloud services” said Ann Von Lehmen, the ACS program lead.

AT&T was responsible for developing the overall networking architecture for this concept, drawing on its industry leadership in bandwidth-on-demand (BoD) technologies and advanced routing concepts. IBM provided the cloud platform and intelligent cloud data center orchestration technologies to support dynamic provisioning of cloud-to-cloud communications. ACS contributed its expertise in network management and innovation in optical-layer routing and signaling as part of the overall cloud networking architecture.

Cloud computing already has widespread impact across how we access today’s applications, resources, and data. Today’s traditional cloud computing model is built on the premise of automation and lower operational costs, which requires dynamic provisioning of resources. However, the traditional cloud-to-cloud network is static and creating it is labor intensive, expensive and time consuming.

In response to the rapid advent of cloud-based services and explosion in data center size and scope, Cloud Service Providers (CSPs) have installed automatic and intelligent resource management systems within their data centers. For example, these systems can load balance both processor and storage resources, as well as perform massive transfers of data among multiple data centers.

“These shifts have driven the need to develop rapid and high rate bandwidth-on-demand in the Wide Area Network (WAN),” said Robert Doverspike, executive director of Network Evolution Research at AT&T Labs. “By combining software defined networking (SDN) concepts with advanced, cost-efficient network routing in a realistic carrier network environment, we have successfully demonstrated how to address this need.”

This prototype was implemented on OpenStack, an open-source cloud-computing platform for public and private clouds, elastically provisioning WAN connectivity and placing virtual machines between two clouds for the purpose of load balancing virtual network functions. The use of flexible, on-demand bandwidth for cloud applications, such as load balancing, remote data center backup operation, and elastic scaling of workload, provides the potential for major cost savings and operational efficiency for both CSPs and carriers.

“This technology not only represents a new ability to scale big data workloads and cloud computing resources in a single environment but the elastic bandwidth model removes the inefficiency in consumption versus cost for cloud-to-cloud connectivity,” said Douglas Freimuth, IBM Research Senior Technical Staff Member and Master Inventor. “IBM Research brought a unique understanding of both cloud environments and networking infrastructures which made us an ideal collaborator for this project.”

Instigated in 2007, the DARPA CORONET program seeks to develop the target network architectures and technologies needed to build next-generation bandwidth on demand services. During Phase 3 of the multi-phase project, which was completed at the end of May, the current group of collaborators brought together the necessary cutting-edge research and industry expertise to potentially deliver this technology from a research

lab to commercialization.

The DARPA long-term commitment to research was vital to kick-start these ideas and this current proof-of-concept trial is a key enabler along the path to commercialization in the telecommunications industry.

Further reinforcing the industry need for this type of technology, AT&T recently announced its vision for the network of the future – titled the User-Defined Network Cloud. This transformative initiative to move to a cloud-based architecture will utilize SDN tools in the WAN to create a programmable network that is more flexible, efficient and aware of applications.

Complementary BoD capabilities are already commercially available between AT&T's network enabled cloud solution, AT&T NetBond – which allows network capacity to scale or contract on demand based on the cloud workload's needs – and public cloud services, such as IBM's Cloud Managed Services. When coupled together, these solutions enable highly secure, reliable and dynamic connectivity between a customer's MPLS-VPN network and IBM's public cloud services.

How it Works

In the demonstration, the IBM cloud platform and orchestration technology manages the life cycle of Virtual Machine (VM) network applications on OpenStack software to automatically monitor server load and request both cloud-to-cloud network bandwidth from a SDN WAN Orchestrator developed by AT&T and compute resources as needed for VM migration.

The AT&T SDN WAN Orchestrator automatically routes data server connection requests across the appropriate network layer: IP/MPLS, subwavelength or Dense Wavelength Division Multiplexing (DWDM). Rapid, robust provisioning protocols developed by ACS are integrated with commercial transport DWDM network elements to set up and tear down connections as needed.

In the demo, setup times as short as 40 seconds were achieved, with sub-second provisioning times possible with next generation DWDM equipment (called ROADMs). This approach also takes BoD into a truly dynamic regime, by enabling the high-connection request rates that will be required in future cloud service environments.

"The DARPA CORONET program has created a truly innovative solution that will enable dynamic cloud services of the future. By delivering highly efficient bandwidth sharing, this technology will significantly reduce costs for both carriers and cloud providers. It truly is a major step forward for the industry," states Matt Goodman, DARPA Program Manager.

To learn more about this research innovation visit: https://ibm.biz/BdFHPt

About Applied Communication Sciences (ACS)

Drawing on its Bell Labs heritage, Applied Communication Sciences delivers advanced research, consulting and engineering to enable government agencies, utilities and commercial enterprises to fully exploit the future of communications and information technologies. ACS excels at creating innovative technologies and services to

solve the most difficult and complex information and communications problems. The company is headquartered in Basking Ridge, NJ, and is a wholly-owned subsidiary of The SI Organization, Inc.

For more information about Applied Communication Sciences, visit www.appcomsci.com.

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Reliability claim based on data transfer completion rates on nationwide 4G LTE networks. 4G LTE availability varies.

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