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Cloud bursting to commercial providers with Kubernetes

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The demand for computing resources is growing everyday making the capability of expanding capacity to address user needs increasingly important. For research organisations, the Open Clouds for Research Environment (OCRE) provides an opportunity to exploit the extension of existing computing and platform resources to commercial providers under better conditions. This reality brings a challenge on how to go beyond the datacenter frontier and integrate additional resources from commercial providers to complement the research infrastructures. In this presentation, we will describe a Kubernetes based approach to move applications and expand capacity to any provider with almost zero downtime, minimising data storage and transfer costs, and ensuring customer protection. Kubernetes is supported by most cloud providers and has become a popular solution to manage services and applications over existing infrastructures both public and private. Therefore, Kubernetes can be used as a versatile layer to integrate resources across infrastructures. Ideally, the use of commercial resources should remain transparent to the end-users as if all these resources and applications are inside the research infrastructure. Our answer to this issue is a gateway that enables all deployed services to remain under the control of the research infrastructure. This approach merges a full-featured gateway doing reverse proxy for several protocols and a Domain Name System (DNS) Chain for managing the required resource records.

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