

Towards an Agile Infrastructure to Provision Devices, Applications, and Networks: A Service-oriented Approach

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Abstract

Most industries and organizations use collections of tools, devices, and applications that are growing in complexity. New tools or applications may be acquired and old tools may become obsolete over time. They are often running on a variety of platforms, have different bandwidth and QoS requirements, and in most cases they cannot be accessed through a single point of entry. Moreover, some tools may require specific configurations done by technical experts, or require for a specific bandwidth network. To address these issues, we propose an extensible, reliable, and simple software architecture that can hide the complexity of provisioning the network, running and coordinating the tools. We introduce Eucalyptus, a service-oriented approach for creating an agile infrastructure to provision devices, applications, and their underlying networks, which we collectively refer to as resources. New resources can be custom-built or imported from a third party. They can be integrated into Eucalyptus using a set of Web Service-enabled APIs. Eucalyptus provides a single point of entry to manage and configure available resources, to launch and run them simultaneously at multiple locations, and to coordinate and monitor their activities at runtime. The streams of the events of these resources are captured and used for monitoring and diagnosing each resource. We also provide a workflow management service allowing users to orchestrate services based on the description of the resources, their dependencies and the captured streams to perform certain tasks.