Towards an Agile Infrastructure to Provision Devices, Applications, and Networks

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WHAT IS EUCALYPTUS?
A service-oriented tool to configure and manage resources needed by users collaborating over the net.

KEY FEATURES
- Easy to configure
- Business process management
- Service-oriented: Web services (WS)
- Supported by 1 to 10Gb/s user-controlled Articulated Private Networks (APNs)
- Integration of the SOA with UCLPv2 and dynamically switching between APNs scenarios
- Runs on mixed layer2 and layer3 network

SUPPORTED BY USER-CONTROLLED LIGHTPATHS (UCLP) SERVICES
- Treats network resources as software objects
- End-users can provision and reconfigure lightpaths on-demand to form their own private end-to-end optical networks

SYSTEM ARCHITECTURE DESIGN

COMPOSING WEB SERVICES INTO WORKFLOWS: AN EXAMPLE

A BPEL Workflow for a Video Conference Session

1) Invoke User Mgmt WS to check the user’s authority
2) Invoke Resource Mgmt WS to check resources’ status and their dependencies
3) Invoke APN Mgmt WS if needed
4) Invoke Resource Mgmt WS to launch the resources
5) Update resources status

DESCRIPTION OF RESOURCES

EXPECTED IMPACT
- The emergence of SOA and UCLP herald the beginning of a new age where fully collaborative multi-site design may become the norm
- The advanced network user community will benefit from the structure and function of Eucalyptus

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ACHIEVEMENTS
- The value of Eucalyptus is recognized by users, tool vendors, system integrators and venture capitalists
- A few big companies are interested in adopting the Eucalyptus platform for their industrial environments

Eucalyptus: Collaborative Architecture Design between California and Canada — Winter Simulation Conference 2006 • Monterey, California •

ONGOING AND FUTURE WORK
- Streamline the process of adding new resources
- Provide Semantic descriptions for the resources
- Compose workflows based on the current tasks and network availabilities
- Monitoring and recovery
- Towards a generic middleware solution for Broadband Video Communications