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Construction of Universal Visualization as a Service (VaaS) on PRAGMA-ENT

Motivation and Objectives

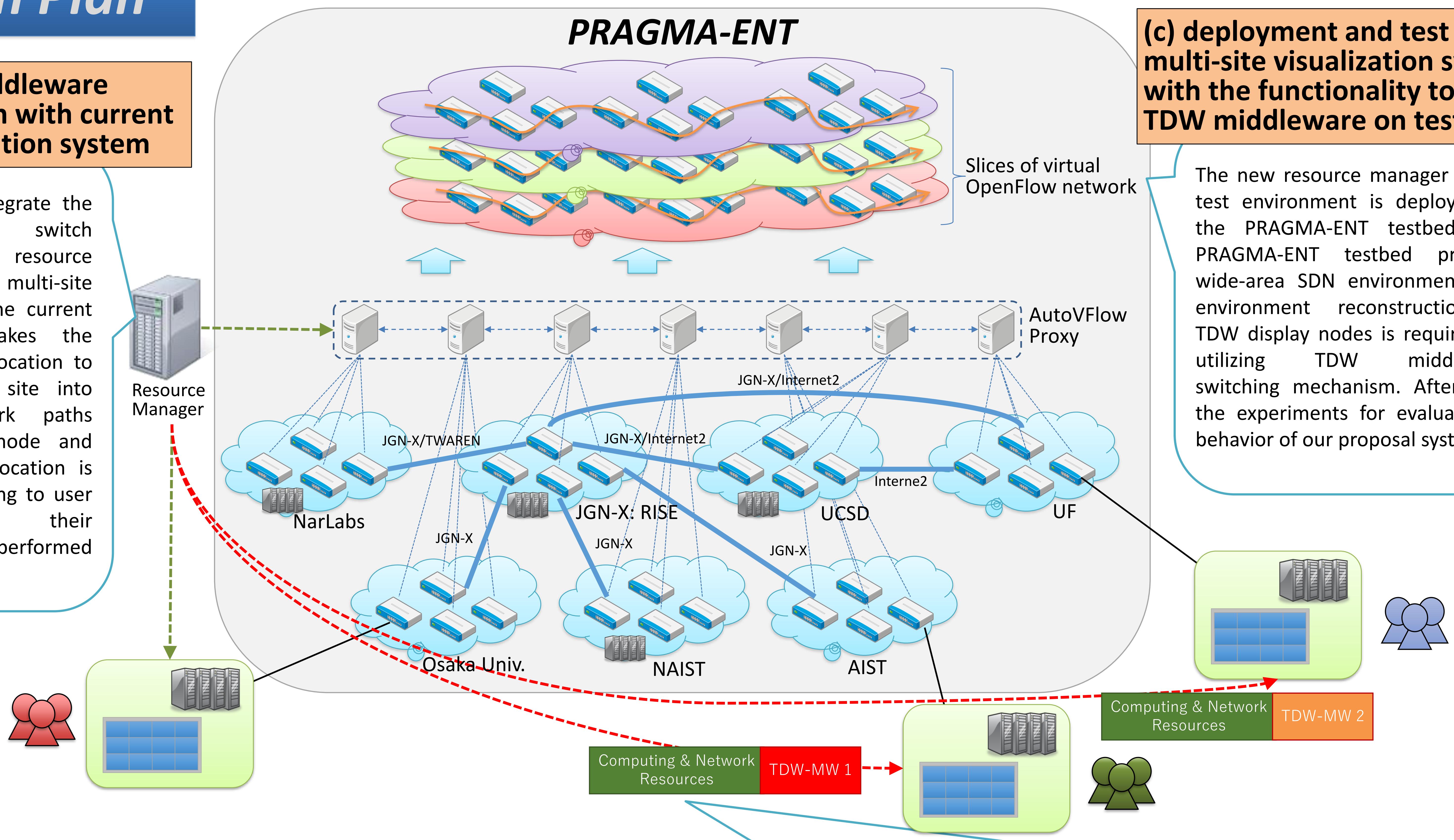
- The large-scale and distributed visualization system on multiple sites has an important role to achieve the environment with Software-Defined IT infrastructure, where the flexibility and resilience are required by an application like a disaster management.
- Since the visualization system needs to provide various information for multiple users, Tiled Display Wall (TDW), which has large-scale and high-resolution display, is suitable for the disaster management applications.
- TDW is composed of multiple displays and computers, and the screen display is controlled by TDW middleware.
- There are various type of TDW middleware and the visualization application generally depends on the middleware.

Mechanism for switching a required TDW middleware and deploying it on the multi-site visualization system

Research Plan

(b) integration middleware control mechanism with current multi-site visualization system

This stage aims to integrate the TDW middleware switch mechanism into the resource manager of current multi-site visualization system. The current resource manager takes the computing resource allocation to an application on a site into account and network paths between application node and TDW. The resource allocation is also performed according to user requirement. Thus, their processes should be performed simultaneously.



(c) deployment and test of multi-site visualization system with the functionality to switch TDW middleware on testbed

The new resource manager to the test environment is deployed on the PRAGMA-ENT testbed. The PRAGMA-ENT testbed provides wide-area SDN environment. The environment reconstruction of TDW display nodes is required for utilizing TDW middleware switching mechanism. After that, the experiments for evaluate the behavior of our proposal system.

(a) Development of a mechanism to deploy various TDW middleware

In order to enable to deploy an arbitrary TDW middleware on display nodes, the environment for each TDW middleware is constructed on virtual environment. For coexisting multiple TDW middleware, the isolation at OS level is required. For achieving the isolation, we propose a mechanism to construct each TDW middleware environment in Linux container and then switch them according to the user requirement.

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