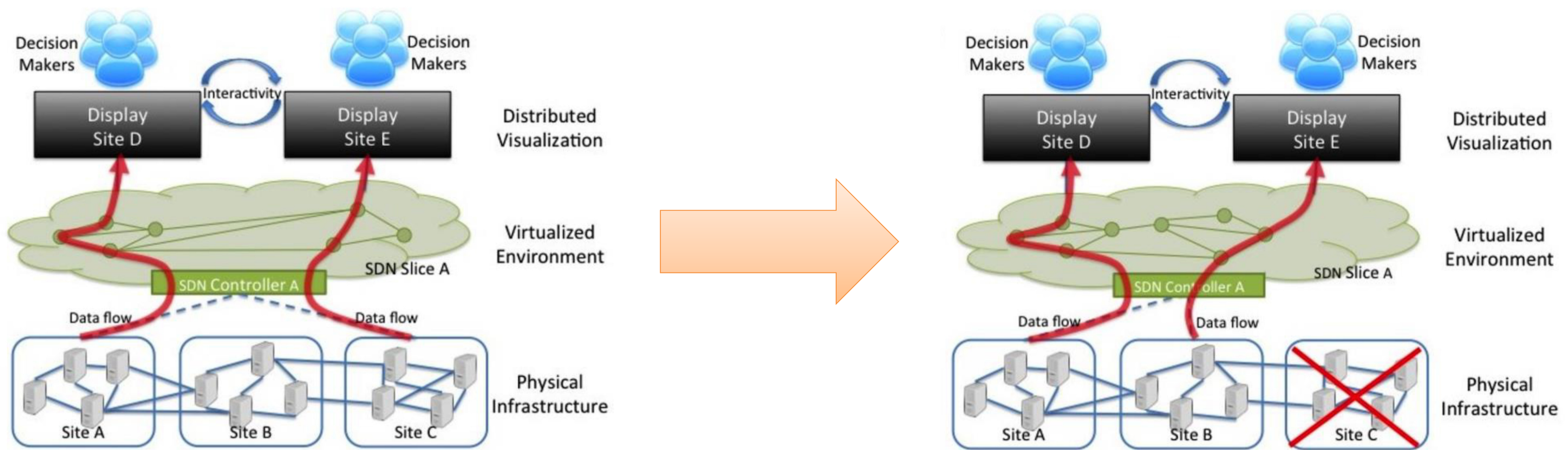


# Toward a resilient software defined infrastructure to support disaster management applications



## Motivation and Objectives

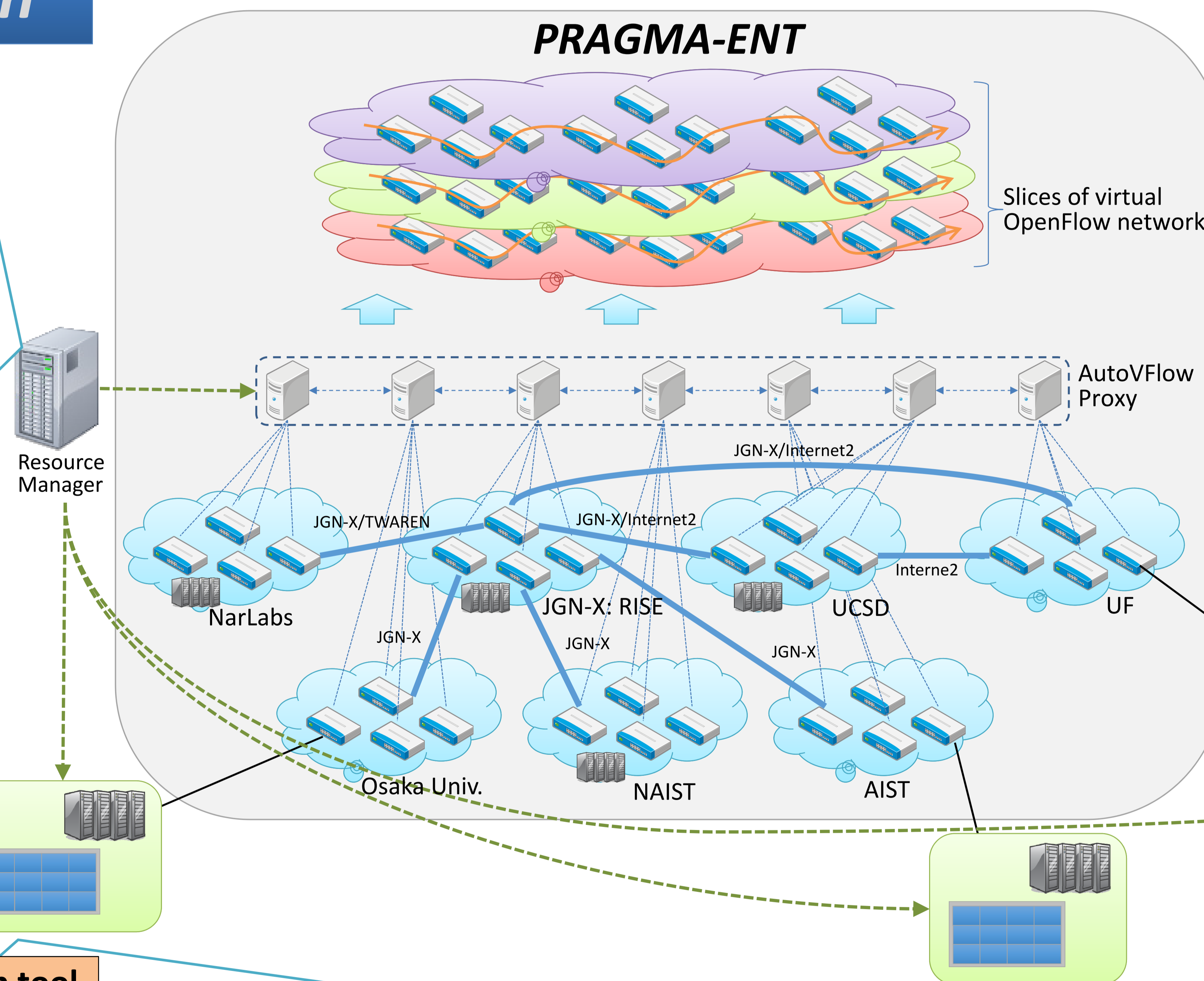
- The concept of Information-as-a-Service (InfaaS) is a critical one for disaster management, before, during, and after a disaster.
- Critical need for a system that synchronizes, visualizes, and maintains different types of data, between different groups of decision makers.
- Information continuity should be maintained even as different portions of the infrastructure are compromised, thus requiring fault tolerant components.
- The use of software-defined techniques has the potential to offer the needed flexibility and resilience to IT infrastructures.
- The goal is to prototype a software-defined IT infrastructure to support the continuous distributed visualization for big data analysis during a disaster.
- This is a first step in developing a large-scale crisis informatics system that is flexible and reconfigurable depending on the needs during a disaster.



## Research Plan

### (b) Resource management

Since the synchronization of data presentation requires quick generation of map data for different resolutions and frame rate adjustment for the corresponding network streams, it is essential to allocate an appropriate set of resources to meet these demands. The creation of such SDN based infrastructure is developed on the **SDN-enhanced JMS framework**, which allows control of both computational and network resources based on the requirements.



### (c) SDN testbed

Testing the robustness of the tool on a resilient infrastructure will leverage on the **PRAGMA-ENT testbed**. This testbed is designed for extensive network experiments and is especially suitable for testing the robustness of the multi-site visualization tool and underlying SDN technologies. The visualization tool will be deployed at different tiled display walls and connected to the PRAGMA-ENT through SDN-enabled network.

### (a) Multi-site visualization tool

It is implemented as a **virtual "whiteboard" or workspace** where the same data is presented to multiple visualization environments in geographically distinct regions. Geographical maps are an essential starting point of discussion among decision makers, thus as a first step, this research project will deploy a collaborative environment centered on geographical maps among multiple large-scale visualization devices. This multi-site visualization tool can superimpose a large variety of geo- and time- referenced data from different sources on the geographical map, providing all decision makers with a shared set of geo- and time-referenced data.

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