

MSG-168 Lecture Series on Modelling and Simulation as a Service (MSaaS)

8. MSaaS Provider Demonstration NUADA

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ABSTRACT

This paper describes an implementation of MSaaS as provided by Thales's NUADA, which compliments the live demonstration provided during the lecture.

1.0 INTRODUCTION

NUADA is a new digital solution developed by Thales that simplifies the planning, preparation and delivery of Synthetic Collective Training and other activities that employ networked simulation environments.

NUADA reduces the amount of effort required and the time taken to setup and manage simulation-based events. It allows those who are not simulation technical specialists to easily prepare and deploy simulation environments including enabling the reuse of assets and the repetition or modification of past events. The result is a reduction in the costs of running simulation events and the ability to provide an agile response to changing requirements.

1.1 Synthetic Collective Training

As the operational environment becomes more complex, so it becomes more difficult to train, plan and prepare for operations. Our forces need to become more adaptable to different types of threats and opportunities. Training using a mix of Live, Virtual and Constructive assets is effective at providing individual training. When individuals are working together in larger teams – between geographically separated groups or those working across domains (for example coordinating land and air forces), the time and effort needed to coordinate this Joint and Collective Training can make it more difficult to achieve a good result.

Networked synthetic training systems can vary in scale. A small scale system might incorporate two or three simulators connected together at a single location. A large scale system might comprise dozens of simulators connected together across multiple geographical locations, potentially across multiple countries. A smaller scale system will likely be used to deliver only one training exercise at any given time but a larger scale system may be required to support the simultaneous delivery of multiple training exercises for different groups of trainees.

Collective training systems are typically composed of the simulators, the network linking them together and a whole set of infrastructure tools and services that facilitate the delivery of coherent training to all trainee

participants. There will be a number of staff to manage and operate the system. These will include the ‘White Force’, the military subject matter experts who act as instructors and animators, and the technical specialists that operate and maintain the simulators and associated systems.

Each training exercise, or event, requires preparation, both the logistics of co-ordinating people and simulation equipment, and the preparation of the material to be used in the training scenario. Exercise execution requires the standing up of the simulation environment, including ensuring network connectivity is setup and the simulation equipment and applications are correctly prepared and configured. After Action Review requires a different configuration of equipment to allow the exercise to be replayed and analysed for the benefit of trainee learning.

The whole process of managing an event can therefore be a complex enterprise involving the use of multiple tools to process and manipulate multiple assets and data over a lengthy period of exercise planning, preparation and delivery.

2 REDUCING COMPLEXITY AND IMPROVING EFFICIENCY WITH NUADA

NUADA is a tool that simplifies the process of delivering training events by providing the ability for non-technical personnel to define a simulation environment using a library of simulation assets and then use automation to instantiate the simulation environment when required for the event.

A Collaborative Working Environment (CWE) is provided by NUADA that enables a team to provide and share information as they work together on the planning, preparation and delivery of Events. The Collaborative Working Environment enables teams to work together efficiently even when they are geographically distributed. COTS office tools are used to provide document authoring and management, email and text, voice and video chat.

NUADA supports the preparation and delivery of events where a number of participants need to be connected together in a simulation environment. Events can be for training, experimentation or other purposes and participants can be co-located at a single site or distributed across multiple locations. Connectivity can be between physical simulators and simulation applications and services deployed in a cloud environment. Due to NUADA’s dynamic deployment capability, multiple Events can be run concurrently across the same infrastructure.

Figure 1 shows an example simulation environment that could be used for a training event where physical simulators and an exercise control facility are connected with common back-end services running in a cloud environment.

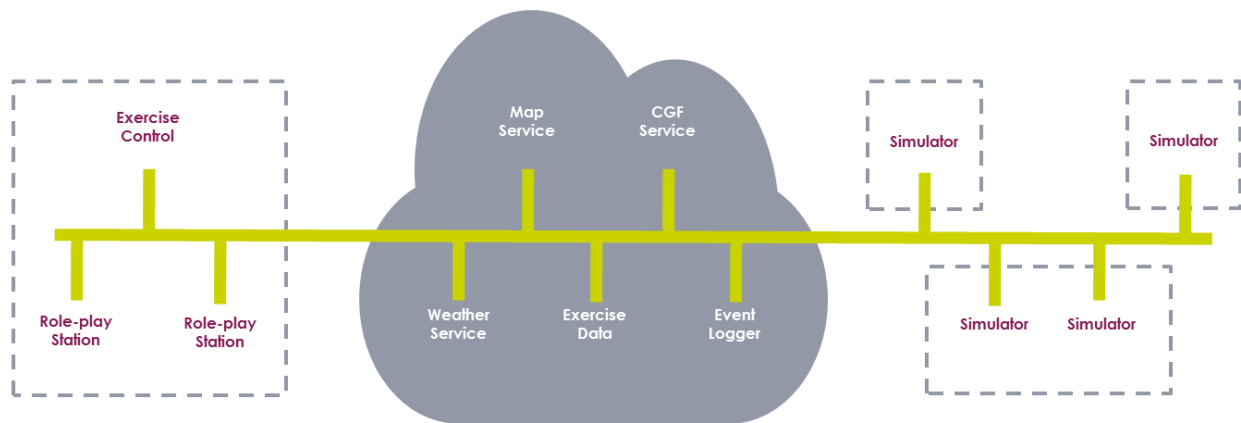


Figure 1: An example simulation environment

NUADA assets are tangible items that can be easily understood by non-technical staff. They may be software, hardware, facilities or personnel, or a combination of these. Example assets could be ‘Flight Simulator #2’ (Physical Asset), ‘Exercise Director’ (Personnel) and ‘Computer Generated Forces’ (Software Asset).

The NUADA user can define a specific simulation environment by ‘Composing’ the desired Assets into an Asset Plan via a drag and drop style interface. The Asset Plan can then be associated with an Event Plan to define the specific simulation environment to be used for a specific event (Figure).

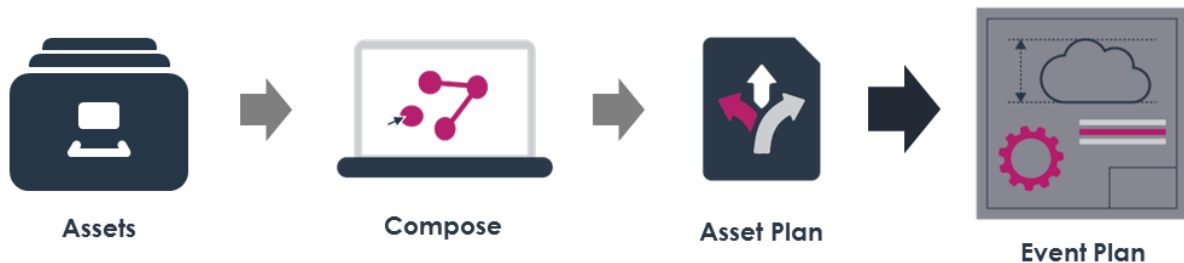


Figure 2: NUADA Event Plan Creation

Assets are created and modified by technical staff capable of providing the required Asset configuration information. But once created and approved for use, Assets can be used by non-technical staff to create Asset and Event Plans. This reduces the amount of time that specialist technical staff are required, front loading their effort into the relatively low frequency activities of Asset creation and modification and enabling the non-technical staff to build and re-use Asset and Event Plans.

An Event Plan contains all the necessary information for a simulation environment to be instantiated via NUADA’s automated Deployment process (Figure 1).

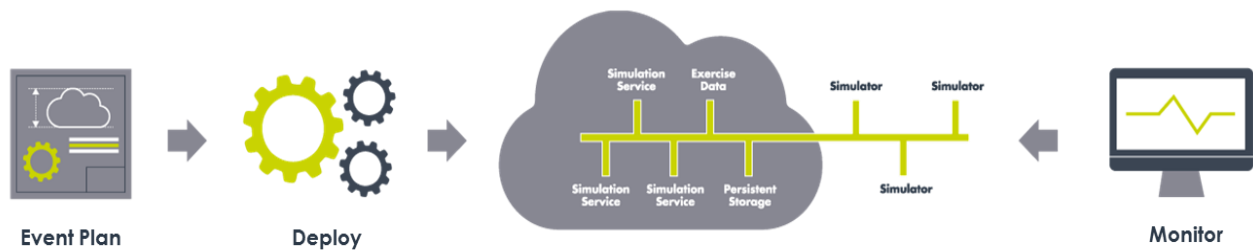


Figure 1 NUADA Event Plan Deployment

When an Event Plan is selected for Deployment, virtual machines are created in the cloud, software applications and services are installed, configured and launched. Virtual networks are created connecting the relevant physical simulators and the instantiated software applications and services. The simulation environment is instantiated and ready for use. This enables complex distributed simulation environments to be deployed by just selecting the required Event Plan and doesn't require technical expertise.

NUADA supports multiple separate simulation environments so that concurrent events can be delivered. A monitoring facility allows both technical and non-technical staff to easily understand the status of all the instantiated environments.