“Hello everybody. Sorry for the slight delay. So we're here to demonstrate how modeling simulation service can provide it on-demand. If you see that the

simulation of the top was ready ten minutes ago. We started, it was the problem we had out there, was getting the PowerPoint presentation.

So I'm gonna give you an overview, here now of the UK research approach to delivery of modeling and simulations and service. This is something we've been working with sixteen nations within NATO on. In order to develop a framework and a proof-of-concept approach of how of what exactly modeling simulation services. And you see on this diagram here are sort of a OV1, a overview of all of that. So if you see this describes a model, where people can access the community of interest to share common M&S processes products and datasets. So going out to sort of the industry academia or across government to access different models data and simulation and better be able to integrate that through different composition services, and then execute that on the hardware of choice. So beyond the cloud or local infrastructure. And then generate that reuse within

them. As a motivation for us, you have lots of different drivers, that are affecting these architectures. We want to deliver simulations of the future, so some of those are ability to have agile architectures to be able to represent the full spectrum of effects Technological advances from non-defense sectors are changing the way that we provide simulation, so things like cloud similar approaches, or big data, or wearable technologies.

How do we integrate those sort of things into our simulations?

We also have UK defense and NATO defense policy, that tries to drive enterprise level coherence, so how can we best reuse our simulation assets and lots of those facets are including things like the NATO M&S master plan, which helps to direct some of those things in how we should develop our simulation systems.

Now, so in terms of a process, we focused on three main areas:

Discovering it, so ability to go and search and discover simulation resources to enable sharing and reuse,

composition - so how can we provide more agile architectures to reduce the cost of the integration cycle, and then how can we deploy and execute our simulations on the cloud survey to enable more on-demand access and availability and scalability.

On that hand over to Keith Ford who's what part of our industry team that have been working on this, it'll give you an overview of some of the tools we've developed to deliver MSaaS.

-"Okay thank you John and good afternoon everybody. So the purpose of my parts of demonstration, is ready to show MSaaS is reveal. It's not just PowerPoint where you have got a reveal tools, prototype tools, we've implemented which we will be capitalizing on in the industry.

So John mentioned about the whole tool set and the what we're doing in building a mystery each nation will have its gonna own port or its own suite of tools.

But the important thing is, we'll have common data. So we can actually share data amongst Nations. So within the UK, we got a research portal here designed by an engineer, whose color sense was worse than mine, but it gets the concept that we can actually access all the tools.

So John mentioned about the process of discovery composition and execute and deployment. So we're gonna look at the discovery part first and here we're ever aging from the geospatial domain.

We got company whose manages tens of thousands of images videos for the UK mod and we realized we could actually leave for each of their technologies and approach. So we've taken their prototype of their tool and turned it into an approach type tool, for use of simulation.

So just going to show a quick example of how searches we can do, what one they pulled it thing. You know if it's saving things away for reuse, which is really the whole concept of MSaaS modernist maton service, you need better find what you've put in your registries and repositories and we need really kind of good discovery tools so this gives you can the power here.

So first of all, I'm just gonna show you how we can find a scenario. Well first of all you just do a search of the registry to find out what's in there. So at the moment it's going back to UK, the registries in the cloud in the UK somewhere and it's been forming queries on what artifacts are in the registry. And it's returned about 65 there we can then filter that so I actually wanted a scenario do another search it's going away and hopefully, after period of time, it will retrieve any scenarios associated them. Know with compositions in the registry and his return 49. So we could actually gonna filter them down more, if I so wants and iOS in that particular area and we've returned three so once you've actually found something you want innovate to be the thing you need to do there, is to evaluate it is it fit the purpose is it what you want to use it for.

So just having a name here, which says kind of person, go for metadata in a date not particularly helpful. So we need to lead to look at the metadata that describes what the registry items doing. So just bring that up the midstate to itself, is an exciting it note tells you what entities are in there who created it maybe what the weather conditions are for scenario environmental conditions. But the important thing with a concept we've got for the registry is, that we can actually bring in other information as well. So it's that you load up on the right-hand side is actually a video the scenario, which actually would show you now how that scenario would in unfold in practice. You could also have other information like bitmaps, which maybe show full slate down you could also include information about use of experience of use no views net scenario.

So we can actually all meant to the metadata with this additional information and that helps you perform that evaluation of it. See if it meets your purpose, or not. So I'm just going to go on to composition then and this is the kind of new area of research shape here.

The composition defines, which services aren't being used together. So here we're using registry again to find some compositions and we've got some hardcoded requirements, in there which we're going to process with a web processing service. Which I'm going to run just by clicking this what's going on there now. A lot of complex searches or a performant it were happen very quickly but a lot of complex urgent perform which identified different compositions which met those requirements and it's actually you listed them in a kind of ranked list of compositions that satisfied or partially satisfied that requirement.

So we can then select the one of them and make open a graphical representation of what these services are in terms of and ability can have a use compositions. We've developed the concept of sub compositions, these are can equip the services, which provide a particular function.

So in this case it could be exercised control and I can expand that sub composition. Which means, these are can a bigger building blocks. We can bring together, which actually will simplify your integration process.

MSaaS is not magic, you still got the play Univ actually kind of integrate in your federate. So all your and your services. But by reducing the number of interfaces with these concept of sub compositions, you don't actually make the problem a lot simpler also in potentially you could actually then have those sub compositions accredited. So when you come to accreditation, it will actually simplify the accreditation process.

And the last tool I want to show, you is the kind of we have actually run in a simulation in the cloud. In the UK and we've actually got a desktop simulator. I'm attached to the Federation, which could represent a full mission simulation. We've actually could be better demonstration on the Tallis buoys on both to four to seven,

I think is and I'm trying to come to know more about it. Please come and see me there in terms of access and Federation. You can actually, we've got a mobile version of that we can access by QR codes, if anyone's got a QR code scanner, they're welcome to scan it and you can actually join the Federation. It's simple as just going to click on the button with that dole hand back over to John “

-“Thank you very much Keith.

As you saw there, that we've actually implemented some of that plan and got some tools. And there you can see some of the points of MSaaS come to life. In terms of some of the potential benefits, there you can see, that you were having that web browser and access to it. You can have on-demand access, to that anytime the architecture enables some agility and able to add new and different services. So , as a new threat or something emerges and theater, hopefully your systems can become more agile, to representing that you can help with the VMV. So you can accredit. You’re the interoperability of your simulations and barbette have coherence in the data, remodels that you're using across your defense Enterprise. But although we can see potential benefits now and into the future. And as we develop emphasis, there's still some risk and challenges to overcome. So in terms of the establishing, the ecosystem for how we build that demander and supplier community, and the business models we need to support that the commercial frameworks and how we procure simulations could that might it might

have affect. That as well, we also need to champion this approach across our organization. So that you can feed this into simulation strategy and policies. So that we can help make it happen and there's other technical issues to do with sort of cloud latency and security that we need to further research.

So just a stuntman summarize: The next steps the NATO MSG 136 has just come to an end, and there can be a new three, or four year Task Group ,starting in February next year. So we're aiming to operationalize MSaaS. So take it on to higher TRL and to and obviously there's this various different R&D aspects, that we need to further enhance to really achieve the full benefits of emphasis. So please if anyone's interested, come along and get involved contact Robert, as a co-chair, or myself and you can get involved.

That's all we had thank you very much thanks for coming”