



FLAMES[®] - Unreal[®] Engine Integration

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Presentation Outline

- Ternion Overview
- FLAMES Overview
- FLAMES Unreal Engine Option
- Ternion Demonstrations

Acknowledgements

Ternion is grateful for the support of Epic Games in the development of the FLAMES Unreal Engine Option, especially:

- **Walt Yates, who introduced Ternion to Epic Games**
- **Sebastien Loze, who helped persuade Ternion to develop this option and provided much encouragement**
- **Alban Bergeret, who answered many technical questions**
- **Epic Games, who helped fund the development**



Setting the Stage

Please keep the following points in mind during this presentation:

- Ternion has grown to love Unreal Engine
- Of course, Ternion loves FLAMES too
- Unreal Engine and FLAMES are not competing products; they are remarkably complementary
- Describing the strengths of one product should not be considered criticisms of the other product

Ternion Overview

Ternion was founded to satisfy the ever-growing requirement for constructive simulations

- **Founded in April of 1989 in Huntsville, Alabama**
- **Developers of FLAMES[®] (FLexible Analysis, Modeling and Exercise System), a commercial off-the-shelf (COTS) simulation framework**
- **Developers of simulations based on FLAMES**



FLAMES Overview

Types of Simulation

There are three types of simulation
(from one point of view)

Live: Real humans – Real equipment

Virtual: Real humans – Simulated equipment

Constructive: Simulated humans – Simulated equipment

FLAMES is a framework for constructive and virtual simulations and for interfaces between live, virtual, and constructive simulations

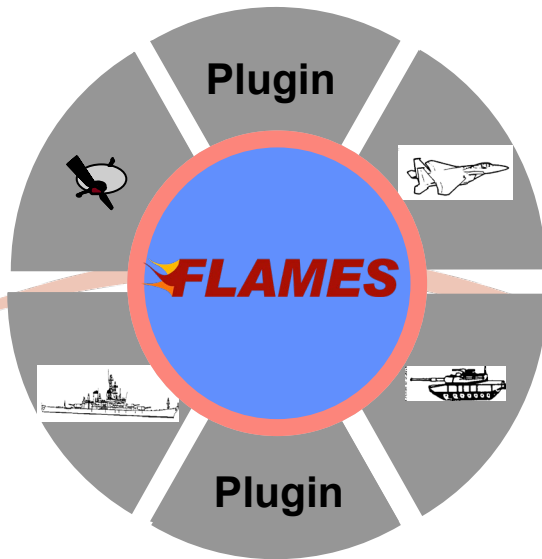
What Is FLAMES?

FLAMES is a family of commercial off-the-shelf (COTS) software products that support the development of custom simulations tailored to specific requirements

- FLAMES is NOT a simulation
- More than 100 different simulations have been developed using FLAMES
- All are properly called “FLAMES-based” simulations
- All simulations are developed on the FLAMES “framework”

The FLAMES Framework

FLAMES is a “framework” for developing custom simulations



**FLAMES-Based
Simulation**

- The FLAMES “framework” includes all infrastructure software and no modeling software
- The framework includes “plugin” interfaces that support almost any type of model
- All models are implemented as plugins that are external to the framework
- Different simulations are created by developing new plugins

Why FLAMES?

FLAMES exists to save time, save money, and deliver more capable simulations

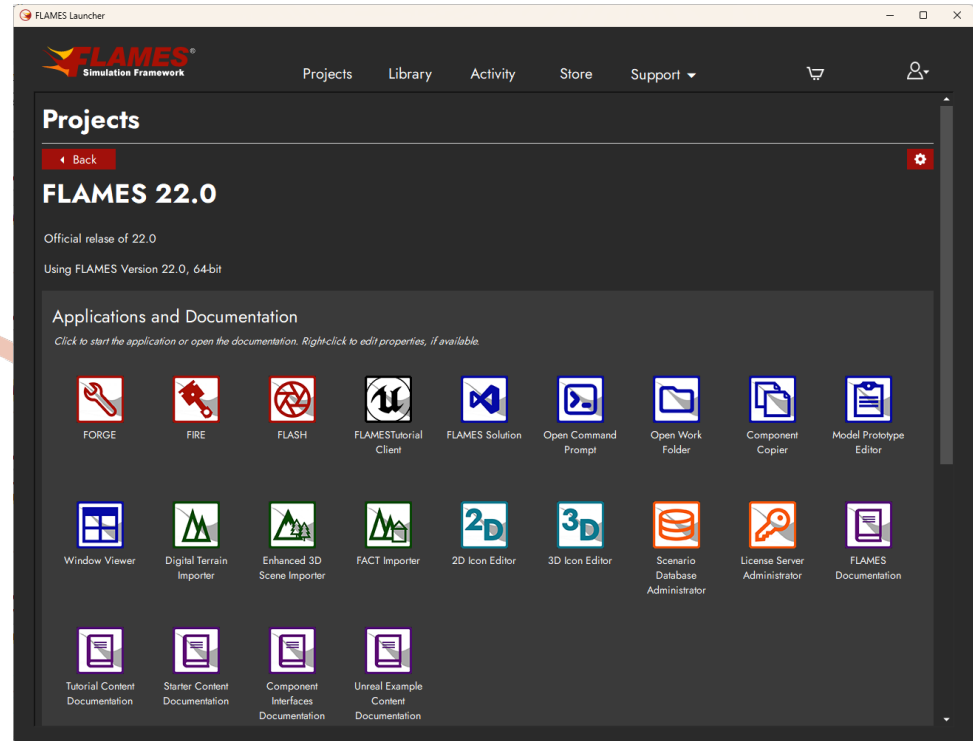
- **Simplifies simulation design**
- **Reduces the amount of software you need to develop**
- **Simplifies the software you do need to develop**
- **Reduces risk**
- **Allows true software reuse**
- **Delivers simulations with more capabilities**

What's Included in FLAMES?

FLAMES Launcher

The Launcher streamlines installing and using FLAMES

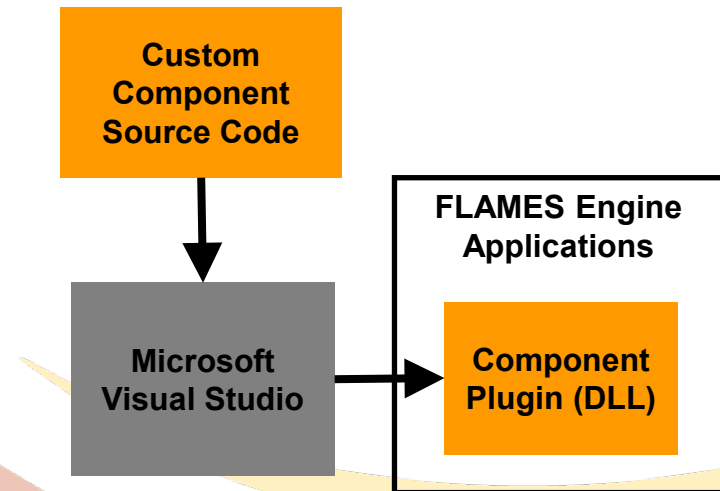
Store
Library
Projects



FLAMES Developer

Software development kit (SDK) and tools to develop custom FLAMES plugins

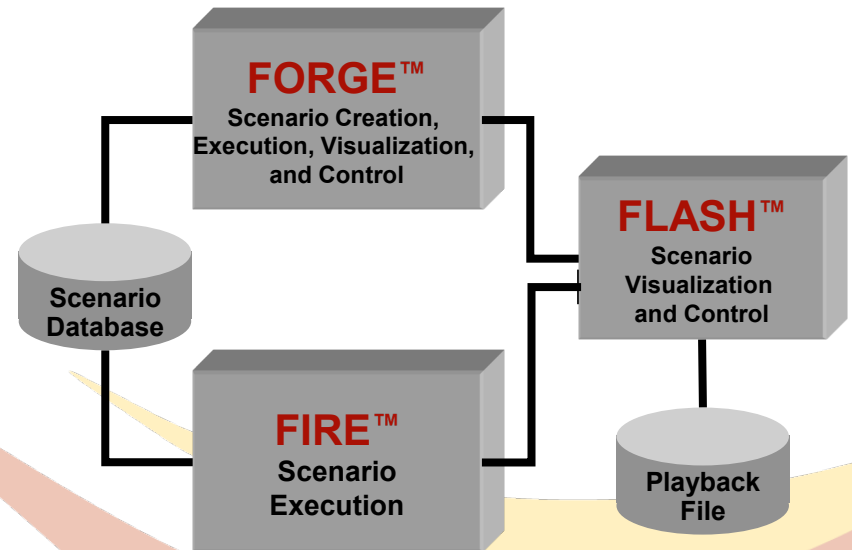
- Base classes for all custom component classes
- Immense library of functions
- Code generation tools
- Uses Microsoft Visual Studio
- Licenses available for FREE



FLAMES Engine

Full-featured applications to create, execute, visualize, and control FLAMES scenarios

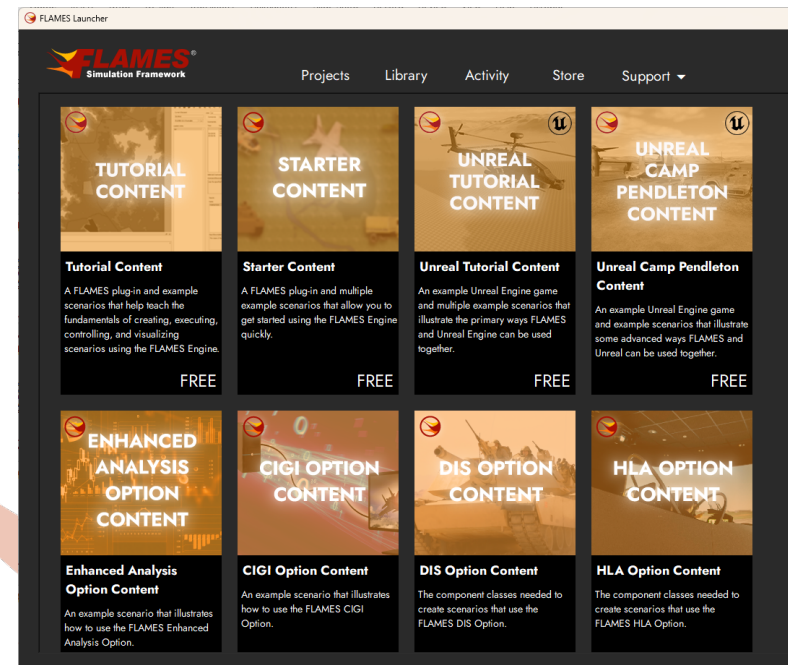
- Complete – no software development required
- Automatically loads specified set of plugins
- “Scenarios” defined in data stored in Scenario Database
- Trial Version available for FREE



FLAMES Content

Become productive using FLAMES without any software development

- Available for FREE in the FLAMES Store
- Plugins, scenarios, and documentation
- Packaged Unreal games



FLAMES Content Source

All the source code to the plugins and Unreal games in the FLAMES content is available for FREE

- Source code is available in GitHub repositories
- Most code written in C++
- Complete Unreal projects are available for games
- Modify or use to start custom development

Documentation and Training Videos

FLAMES is supplied with abundant documentation and FREE training videos

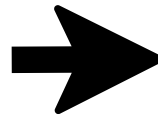
- **User documentation for FLAMES Engine and options**
- **Documentation for developing components and plugins**
- **Access documentation from the Launcher and from application context**
- **Dozens of FREE user and developer training videos available on flamesframework.com website**

FLAMES Unreal Engine Option

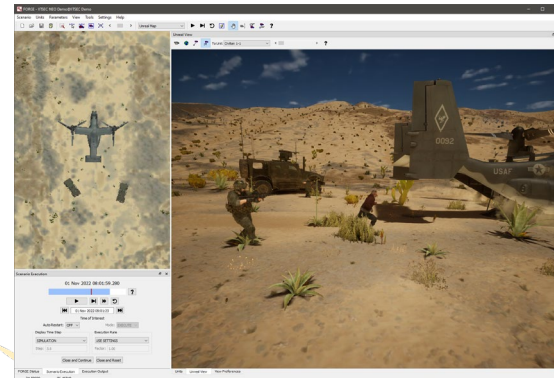
FLAMES Unreal Engine Option

New option integrates Unreal Engine directly into FLAMES

Unreal Editor



FORGE



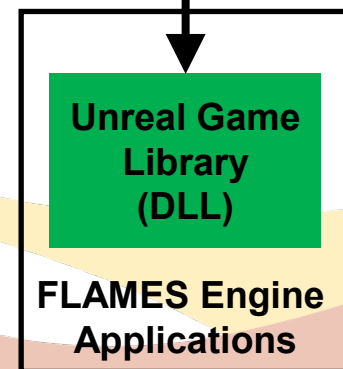
The ultimate framework for creating serious games and 3D, entity-level constructive and virtual simulations

Unreal Game Integration Process

FLAMES integrates Unreal games packaged as “libraries”

- Start from a game project in the FLAMES Store
OR
Start from almost any Unreal game and add the FLAMES plugin for Unreal and other “hooks”
- Normally, create only actor classes (actors are created in FLAMES)
- Package the game as a “library”
- Tell FLAMES where the library is located
- FLAMES automatically integrates the game

Unreal Editor



What Unreal Engine Brings to FLAMES

Nearly every feature of Unreal is available when a game is integrated into FLAMES

- Powerful 3D content editor
- Mind-blowing 3D rendering
- Fantastic motion/physics modeling
- Multiplayer gaming architecture
- FREE and open game development
- Abundant content and plugins available

Unreal Editor



What FLAMES Brings to Unreal Engine

Nearly every feature of FLAMES is available when an Unreal game is integrated

- Powerful support for cognition, command and control, sensor, weapon system, communications, and electronic warfare modeling
- Interactive, collaborative scenario editing without having to rebuild the Unreal game
- Interfaces to live, virtual, and constructive (LVC) systems and simulations
- FREE and open software development
- Library of content and source code

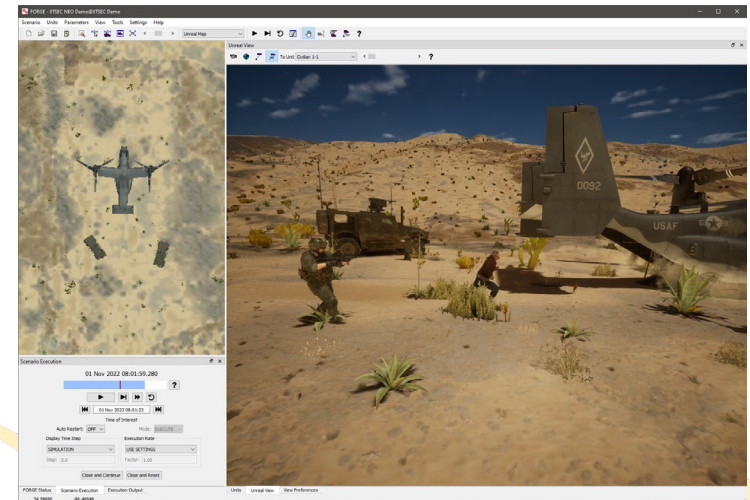


FLAMES and Unreal Engine

More features of the FLAMES Unreal Engine option

- The Unreal game world defines the FLAMES terrain (no “terrain correlation” issues)
- Simultaneous 2D and 3D visualization performed by Unreal during scenario editing and scenario execution
- Full support for Unreal multiplayer architecture

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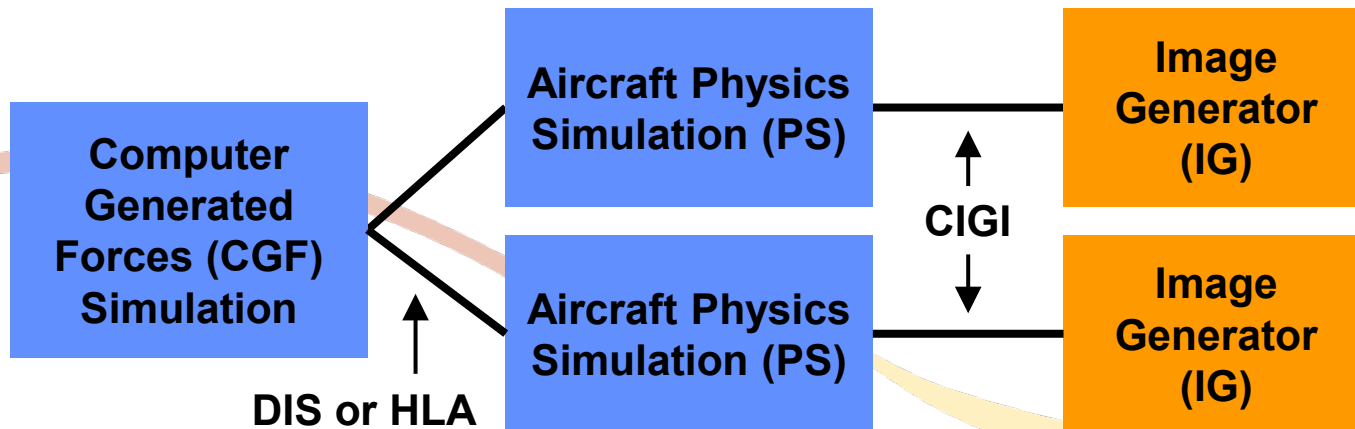


FLAMES Unreal Engine Option Demonstrations

- UAV Video Generation from USAF Air Operations Center (AOC) Training Simulation
- An Aircraft Simulator Unlike ANY You Have Ever Seen

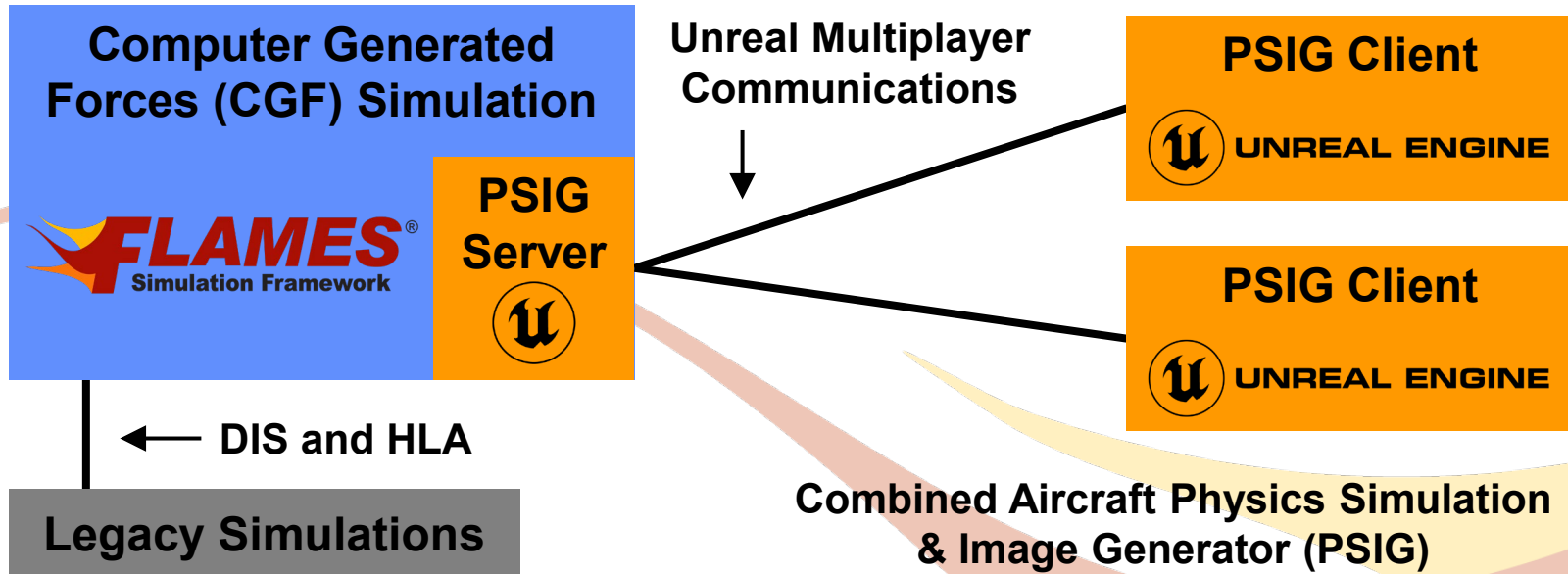
Typical Aircraft Simulator

Typical aircraft simulator architecture based on legacy technology



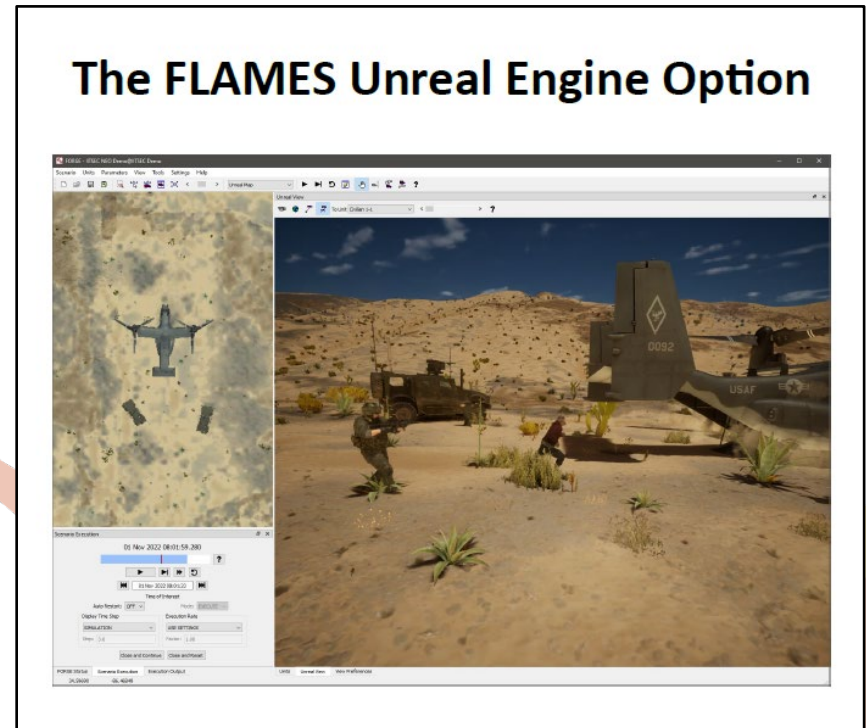
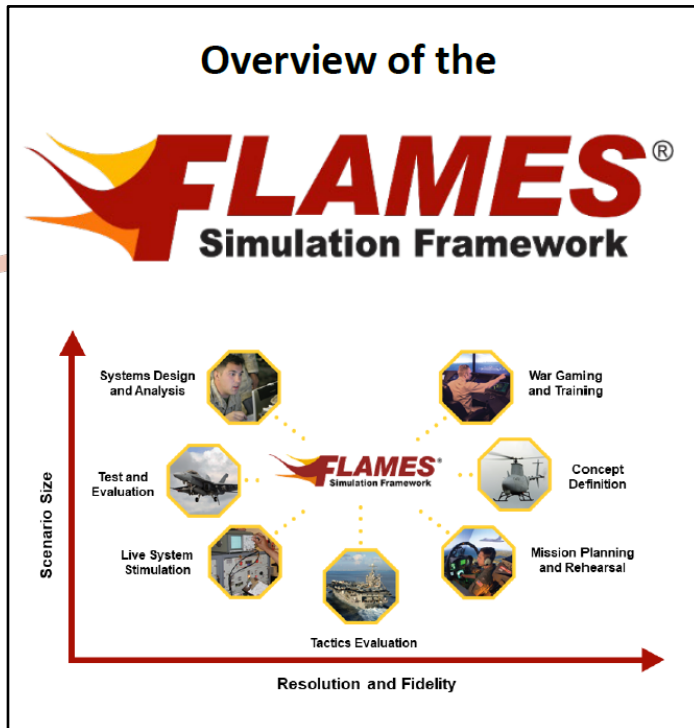
Ternion Demonstration Aircraft Simulator

Ternion's aircraft simulator demonstrates a new architecture based on latest technology



Ternion Whitepapers – Booth 2220

Get Ternion whitepapers for detailed information



Ternion Whitepapers – Booth 2220

More whitepapers on Ternion demonstrations

An Aircraft Simulator Unlike ANY
You Have Ever Seen!



Generating UAV Video from the
Air Operations Center Training Simulation



For More Information

- Download the FREE FLAMES Developer
- Visit us at I/ITSEC Booth 2220
- Schedule a meeting in Ternion's booth
- FLAMES web site: flamesframework.com
- Stay to ask questions

**Thanks for attending.
Have a great day!**