

Exceptional service in the national interest



The MEDEA Interface to Input Deck Driven Codes

MeDEA- Multi-purpose Display & Engineering Analysis

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A serene night sky with a deep blue background. A bright crescent moon is positioned in the upper right quadrant. Numerous small, white stars are scattered across the sky. Wispy, dark blue clouds are visible, particularly on the left side and along the bottom edge.

I dreamed a dream

A photograph of a stone tower, possibly a lighthouse or a church tower, with a small arched window. The tower is made of light-colored stone blocks and is set against a clear blue sky. The lighting suggests it's daytime.

High Performance Scientific Computing

General Purpose Modeling Startup

Domain

Grid/Meshing

Physics

BCs

ICs

Material Geometry & Type

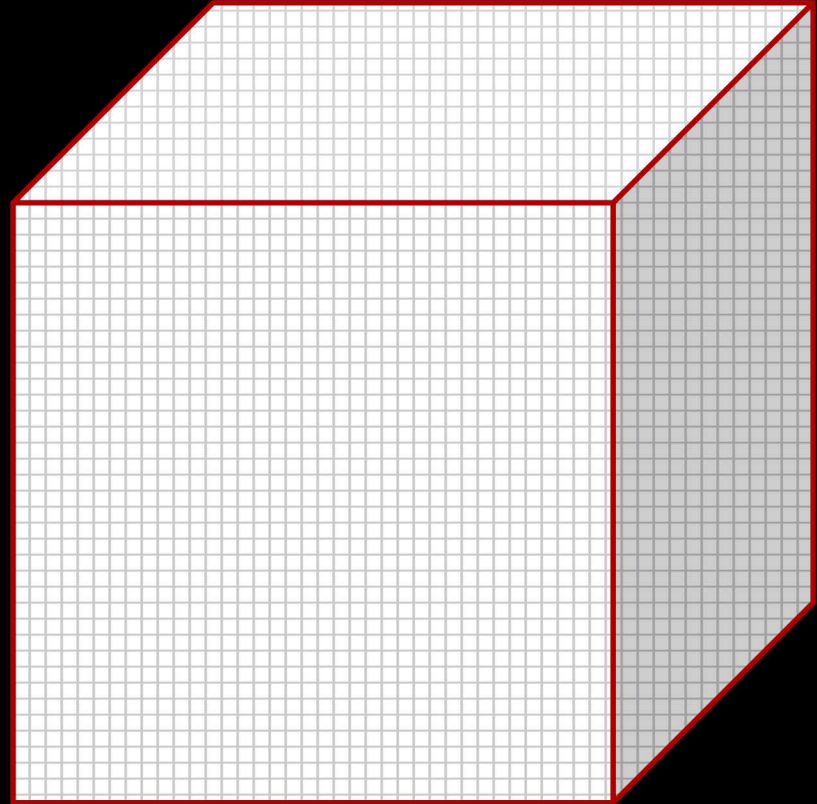
External Coupling (Circuit)

Solvers

Derived Variables

Output

~400 lines of input



What are some common questions asked by novice ALEGRA users?

How do we **SUCCESSFULLY** deploy to larger user bases?





KEEP
CALM
AND
CARRY
ON

TRAINING!

Quality or Quantity





User Templates

\$\$\$\$\$\$\$\$\$\$\$ SETUP - ENTER PARAMETERS HERE \$\$\$\$\$\$\$\$\$\$

\$ =====SET THE END TIME: =====

\$ tend: {tend = 1.0e-6} \$ if too long will have time to reflect from boundary

\$ =====SET THE GEOMETRY AND MESH PARAMETERS =====

\$ wirelength : { wirelength = 10. * 25.4e-6}

\$ diameter: { diameter = 1.0 }

\$ =====SET THE CDU PARAMETERS:=====

\$ resistance: {resistance = 275.0e-3} \$ Ohms

\$ inductance: {inductance = 110.0e-9} \$ Henries

\$ capacitance: {capacitance = 1.14e-6} \$ Farads

\$ voltage: {voltage = -450.0} \$ Volts



**KEEP
CALM
AND
LET'S DO
ROUND 2**





**KEEP
CALM
AND
TRUST THE
PROCESS**



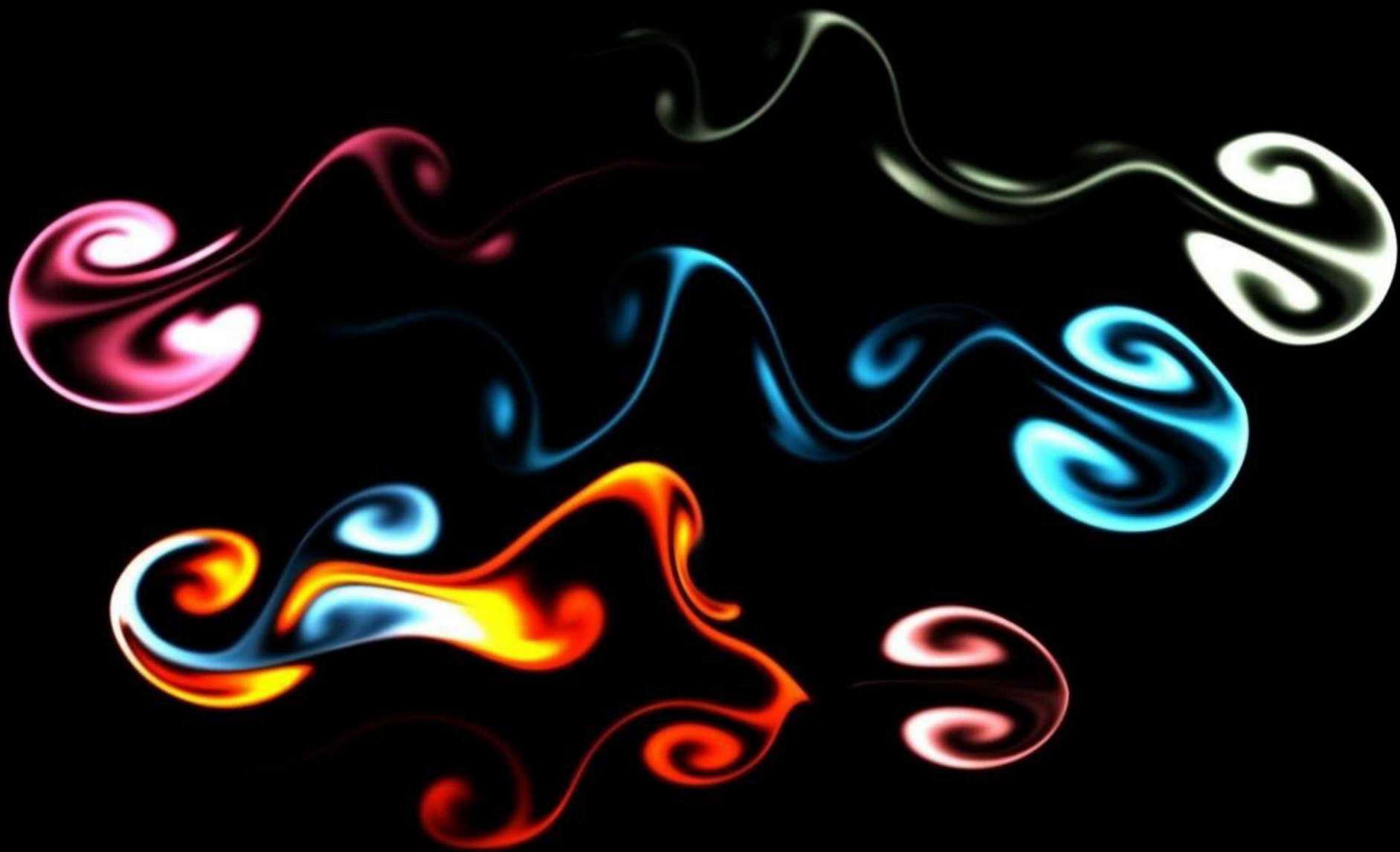




It's LeviOsa



Not LevioSA







High PC



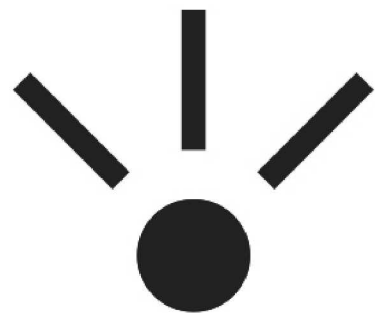
BASIC NEEDS

VIEW

ANALYZE

SIMULATE



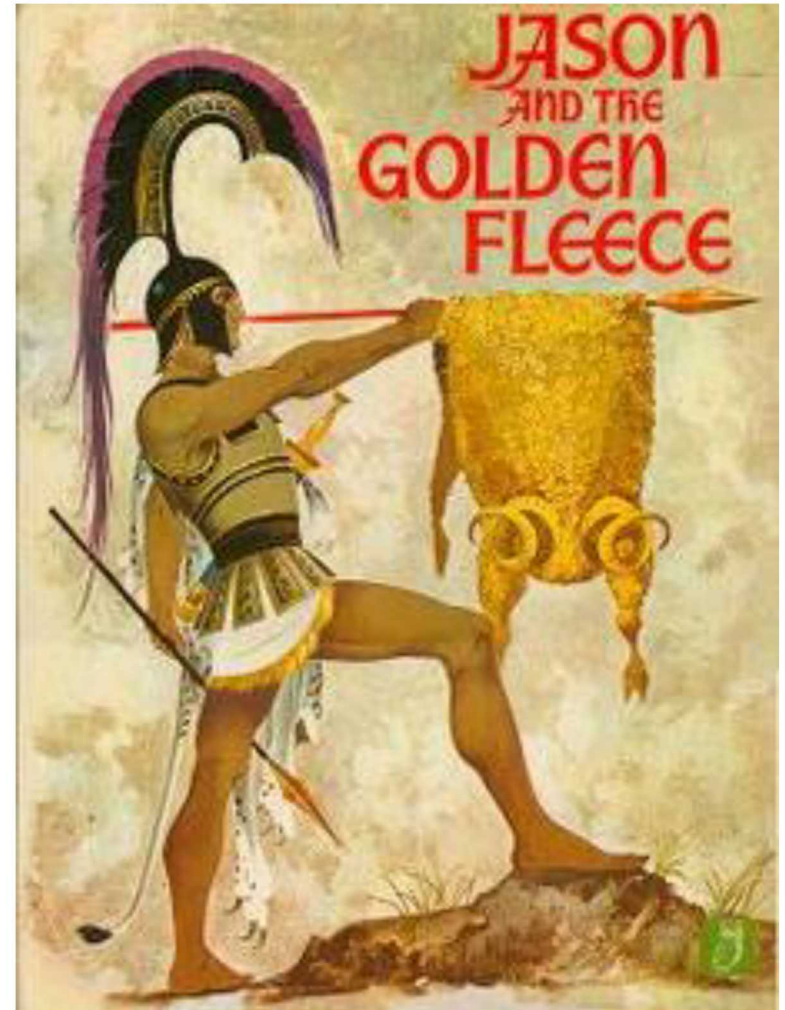


ideum

MeDEA

Multipurpose Display & Engineering Analysis

Put the power in the
hand of the user!





GINSU 2000

The Deluxe 10 Piece Set • Cet ens. de luxe comprend 10 pièces

AS SEEN ON
TELQU'ANNONCÉ À LA
TV



'XML' Example

Input

XMLRelease='03/15/2016'

Dim='2D'

Execution='runAlegra -a -2 -- nprocs 1 '

Group 1

'tend', 'seconds', > 0

Group2

Predefined = 'EBWs.xml'

'Wirelength', 'mils', >0

'Diameter', 'mils', >0

'Material option', ['material 1', 'material 2', 'material 3']

Group 3

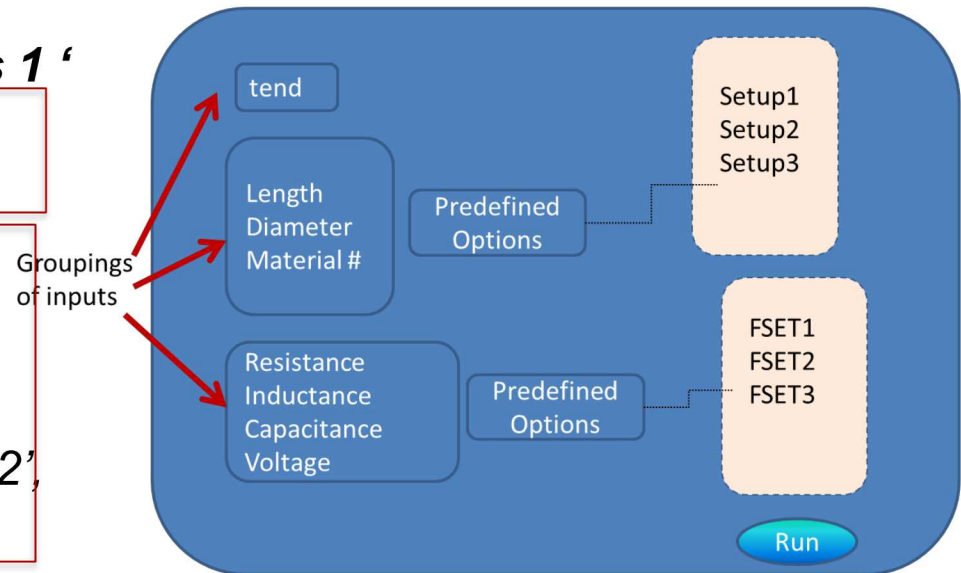
Predefined = 'Firingsets.xml'

'Resistance', 'mOhms', >0

'Inductance', 'nHenries', >0

'Capacitance', 'microFarads', >0

'Voltage', 'volts', >0



Post-process

Update_freq=10 seconds
Plot_layout=[2,2] [columns, rows]
Plot_charsize=2.0

PLOT1
HISPLT: XVAR='Time', YVAR='I-MESH-D1', xscale=1.0e-6, yscale=1.0, xtitle='time', ytitle='Current (A)'
HISPLT: XVAR='Time', YVAR='VOLTAGE', xscale=1.0e-6, yscale=1.0, xtitle='time', ytitle='Voltage(V)'
HISPLT: XVAR='Time', YVAR='POWER', xscale=1.0e-6, yscale=1.0, xtitle='time', ytitle='Power(W)'
HISPLT: XVAR='Time', YVAR='ENERGY', xscale=1.0e-6, yscale=1.0, xtitle='time', ytitle='Energy(J)'

PLOT2
ECONWORM: Tracer#, XVAR=DENSITY, YVAR=TEMPERATURE
EOSWORM: Tracer#, XVAR=DENSITY, YVAR=PRESSURE

PLOT3
EMPERF: ENERGY, MATID='EMMAT.xml'

Dependencies

Inputs

VariableGroup

VariableGroup presets1.csv

VariableGroup presets2.csv

Outputs

ActiveSimulationPlot

X cycle

Y time

ReferenceY

View

MainPlot dual3dplot

Plot3d

File view/al29373.ses

X density2.11

Y temperature2.11

Z econ2.11

Plot3d

Plot2d

X time

Y energy-ind-norm

Y energy-load-norm

Y energy-res-norm

View

MainPlot plot3D

File view/al29373.ses

X density2.11

Y temperature2.11

Z econ2.11

SubPlot 4up

SubPlot lineplot

Var
temperature2.11

Label
Temperature

utri_var

scaling
8.617E-05

log10

MEDEA Input Deck Documentation

XML Documentation

Overview

<nodeName requiredAttribute optionalAttribute>

Header Elements

<release>

<simulationDimension>

<runCommand>

<dependencies>

Input Elements

<variableGroup presets>

<variable type options default>

<variable type keywords units default>

Output Elements

<outputs file time var headerlines>

<activeSimulationPlot>

<view>

<mainplot type xlabel ylabel y2label>

<subPlot type xlabel ylabel y2label>

Plot Types

<[mainplot | subPlot] type="performance" ylabel>

<[mainplot | subPlot] type="multiplot" xlabel ylabel y2label>

<[mainplot | subPlot] type="lineplot" xlabel ylabel>

<[mainplot | subPlot] type="shadedplot" xlabel ylabel>

<mainplot type="quadplot">

<[mainplot|subPlot] type="4up">

<mainplot type="dualplot3d">

XML Documentation

Overview

XML files for MEDEA are broadly structured as follows:

Section	Description
Header	A set of several short nodes, including <release>, <simulationDimension>, <runCommand>, and <dependencies>
Input	A single node, <input>, which contains many children
Output	A single node, <output>, which contains many children and has the required attribute of "file"

The root node of a MEDEA XML file must be declared as <inputDeck>; all of the header nodes, the input node, and the output node are immediate children of this root node.

The header data includes extra metadata about the simulation to be run, and most importantly, the command that will be run within the system (i.e., the path to an executable and its options). *Input nodes* contain all of the relevant information to successfully create an input deck used in the 'Simulate' section of MEDEA. Finally, *Output nodes* are essential for configuring how MEDEA visualizes the data of either an active simulation (launched through MEDEA) or a previously run simulation (either previously run in MEDEA, or placed within the file system).

MEDEA can be used for ANY input deck driven code!

- Windows compiled code
- Create a input-deck template
- Transfer of input values to the input deck (e.g. “include”)
- Write the XML file for the pre- & post-processing
- Code output format reader (e.g. CSV, Exodus, hisplt, etc.)

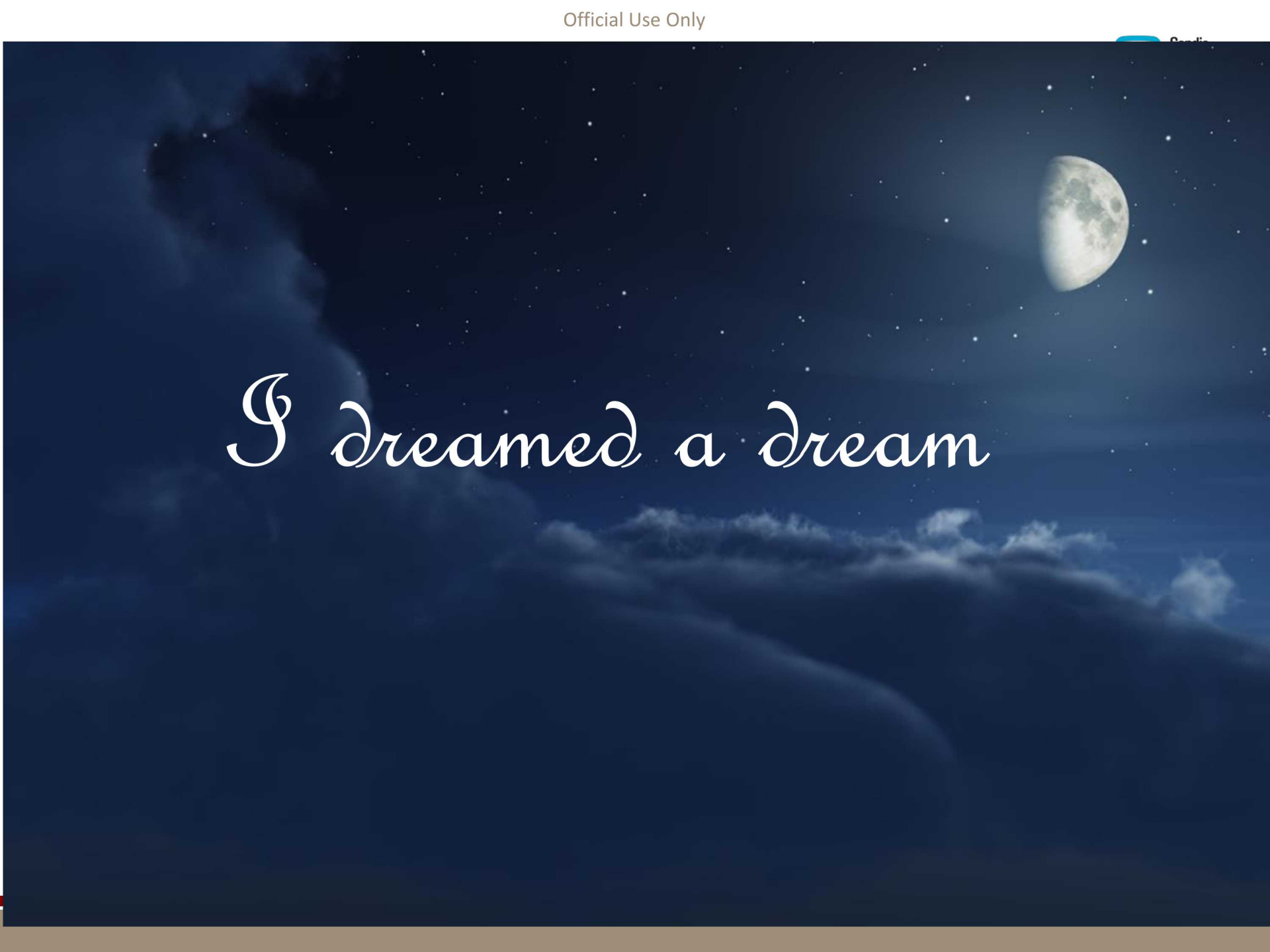
Targeted Platforms

Windows
Desktop/Laptop
w/ mouse



Windows
touchscreen
devices (surface
Pro and Book)

Windows 8 & 10

A night sky with a crescent moon and stars. The moon is in the upper right, and there are many small stars scattered across the dark blue sky. Some clouds are visible in the lower half of the image.

I dreamed a dream

FIN