MATLAB EXPO 2016
Sharing and Deploying MATLAB Applications

Dr. Roland Michaely
Applications Engineer
ICICI Securities Develops Online Financial Planning and Advisory Platform

Challenge
Launch a scalable online financial planning and advisory platform

Solution
Use MATLAB and MATLAB Compiler to develop and deploy algorithms for determining market correlations, running Monte Carlo simulations, and matching liabilities with assets

Results
- Three-hour, manual process drastically reduced
- Accuracy of suggested asset allocation improved
- Scalable financial planning platform launched

“A dynamic asset allocation strategy based on goal risk and investment horizon.

“Financial analysts and investment advisors typically do not have the programming skills to code effectively. Yet if they do not code themselves, it is difficult to experiment, develop, and back-test new methodologies. Even though our team of investment advisors had limited programming experience, MATLAB enabled us to develop and deploy a full-featured financial advisory platform.”

Abhishake Mathur
ICICI Securities

MATLAB EXPO 2016
MATLAB Programs Can be Shared With Anyone

Share With Other MATLAB Users

Share With People Who do Not Have MATLAB

Group Members

Suppliers

Clients

Organization

Collaborators
Write Your Programs Once
Then Share To Different Targets

With MATLAB Users
With People Who Do Not Have MATLAB
Share with MATLAB Users

- Package an App
- Package Entire Toolboxes
- Directly share MATLAB files
App Packaging

- Apps are self-contained tools, typically with a User Interface
- Package your app as single installation file
  - Easy distribution and installation into the apps gallery
  - Automatically includes all necessary files
  - Documents required products
```
energyOutagesApp
```

```
>> energyOutagesApp
```

```
fx
```
MATLAB R2015a

Current Folder

Workspace

Energy Analyzer.mlappinstall

Energy Analyzer.prj
EnergyOutageReporter.prj
energyOutagesApp.m
info.xml
Outage Analysis Reporter.mlapp ...
Outage Analysis Reporter.prj

Command Window

>> energyOutagesApp

fx >>
Custom Toolbox Packaging

- Package your toolbox as a single installer file
  - Contains all of the code, data, apps, documentation, and examples
  - Checks for dependent files and automatically includes them
  - Documents required products

- Included folders and files automatically appear on path when installed

- View details and uninstall toolboxes with Manage Custom Toolboxes dialog box
MATLAB R2015b

Current Folder

- Name
- CustomVisualizationToolbox
- ToolboxIcon.png

Command Window

fx >>
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Share Applications Built Completely in MATLAB

Integrate MATLAB Programs With Your Own Software

- Royalty-free Sharing
- IP Protection via Encryption
Share Applications Built Completely in MATLAB
Use MATLAB Compiler to Integrate MATLAB with Excel

Develop algorithms in MATLAB

Package them as Excel add-ins
Import Add-ins to use MATLAB functions in Excel

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Integrate MATLAB Programs With Your Own Software

Application author and software developer *might* be same person

MATLAB

Toolboxes

1. MATLAB Compiler SDK

2. MATLAB Production Server

3. MATLAB Runtime

Application Author

Software Developer
Lane Marking Identification

One component of future luxury systems is warning drivers that there is a gap between lanes. To do this, it is necessary to identify where the lanes are. In this example, we will look at identifying the edges of a road.
Scale Up with MATLAB Production Server (MPS)

Most efficient path for creating enterprise applications

Deploy MATLAB programs into production
- Manage multiple MATLAB programs and versions
- Hot Deployment: Update programs without server restarts
- Reliably service concurrent requests

Integrate with web, database, and application servers
MATLAB Production Server
Enterprise Class Framework For Running Packaged MATLAB Programs

- Server software
  - Manages packaged MATLAB programs and worker pool

- MATLAB Runtime libraries
  - Single server can use runtimes from different releases

- RESTful JSON interface and lightweight client library (C/C++, .NET, Python, and Java)
Share with People Who Do not Have MATLAB

- Program once, then choose your target:
  - Desktop, Web, Enterprise applications
  - C++, Java, Python, .NET

- Royalty-free distribution

- Encryption to protect your IP
Online Resources

• Documentation – Create and Share Toolboxes

• Website – Desktop and Web Deployment

• Free White Paper – Building a Website with MATLAB Analytics

• Website – Using MATLAB With Other Programming Languages
Summary

MATLAB

MATLAB Compiler

MATLAB Compiler SDK

Apps
Files
Standalone Application
Excel Add-in
Hadoop
C/C++
Java
.NET
Python

With MATLAB Users

With People Who Do Not Have MATLAB

Custom Toolbox

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