

Integrating Python and MATLAB

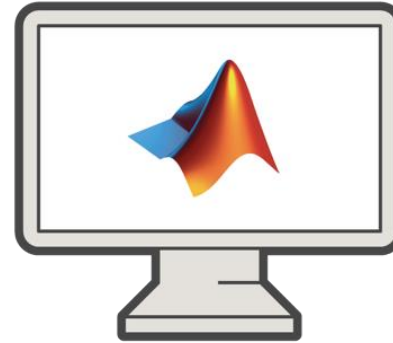
Ian McKenna, Ph.D.
Senior Application Engineer

Agenda

- How MATLAB fits into System Architecture
- Calling Python from MATLAB
- Calling MATLAB from Python
- Packaging MATLAB applications
 - Royalty free .py libraries
 - RESTful API for business critical applications
- Q & A

Solution Architect Technology Landscape

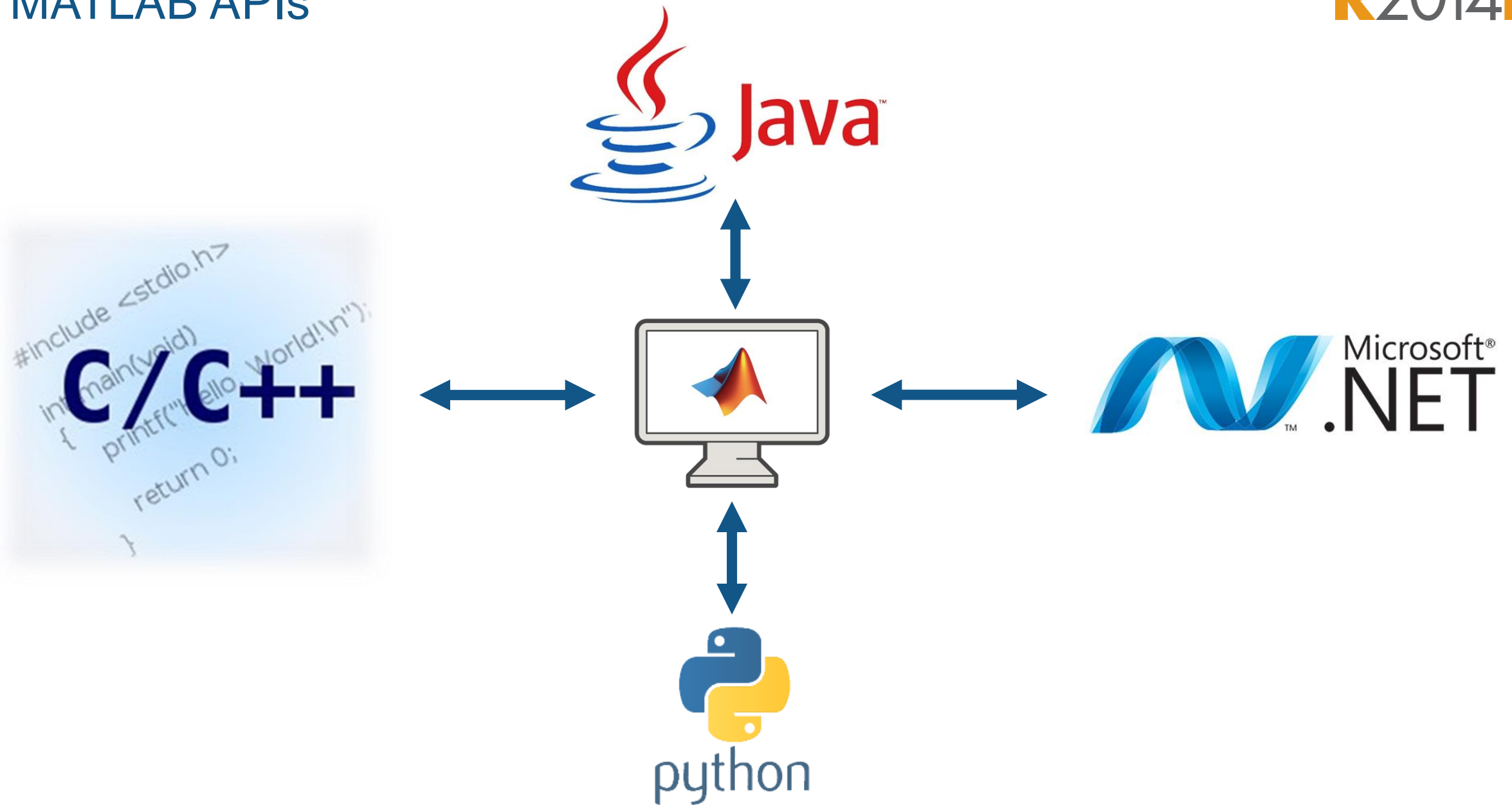
DATA SOURCES



BUSINESS SYSTEMS

CLOUD / WEB

MATLAB APIs



Using MATLAB with Python

- Three ways to integrate:



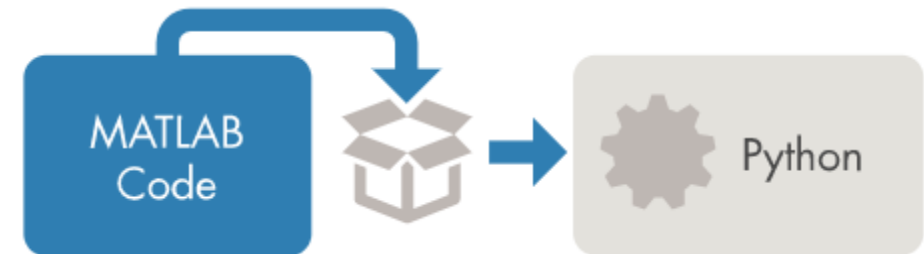
Algorithm
Developers

- Calling Python from MATLAB
- Calling MATLAB from Python



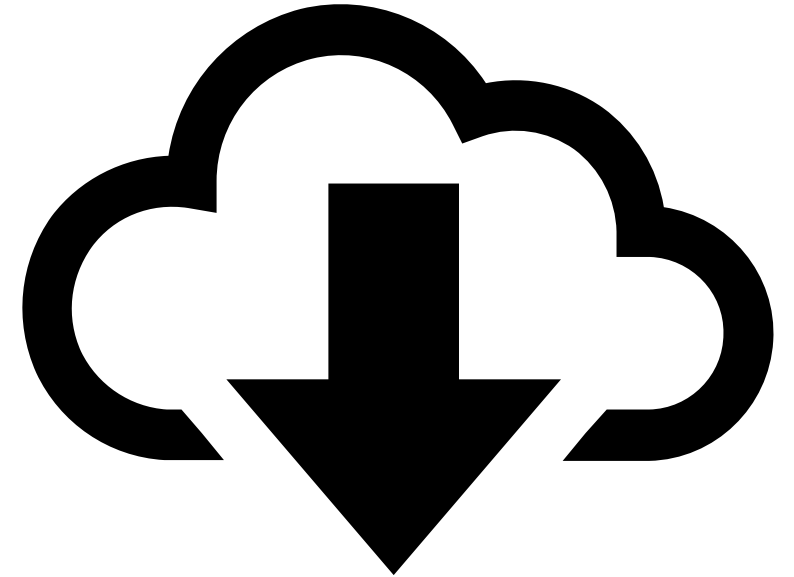
Users

- Packaging MATLAB programs for scalable deployment with Python



Price Trend Predictor

- **Goal:**
 - Software as a service: Cryptocurrency price forecaster
- **Approach:**
 - Use IT managed data import libraries
 - Rapidly build predictive models
 - Deploy analytics to enterprise using RESTful API



Current Setup

Crypto Data



localhost:3000/index.js?crypto=ETH

Price Data

Get current price data for cryptocurrencies

Coin:

Current price: **\$632.83**

Last 24 hours: **-0.11%**



Model
Developers



IT
Professionals



Business
Users

New Idea

Crypto Data



localhost:3000/index.js?crypto=ETH

Price Data

Get future price data for cryptocurrencies

Coin:

Current price: \$632.83
 Predicted price in 1 day: **\$670.21**



Business Users

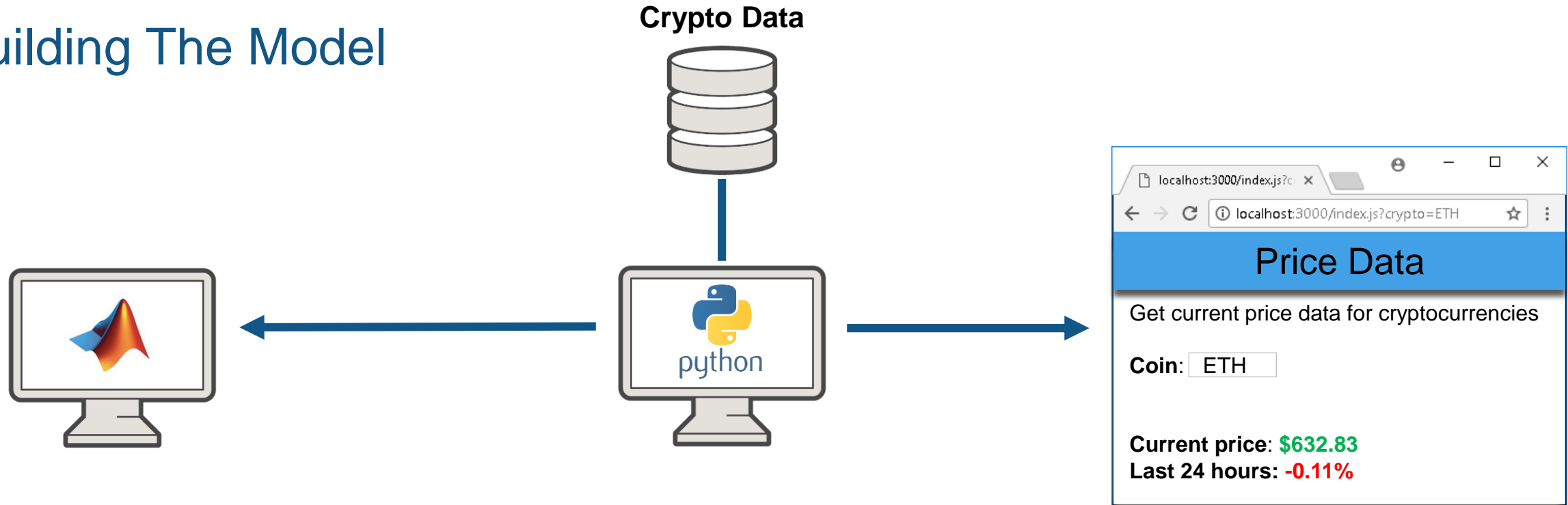


IT Professionals



Model Developers

Building The Model



**Model
Developers**

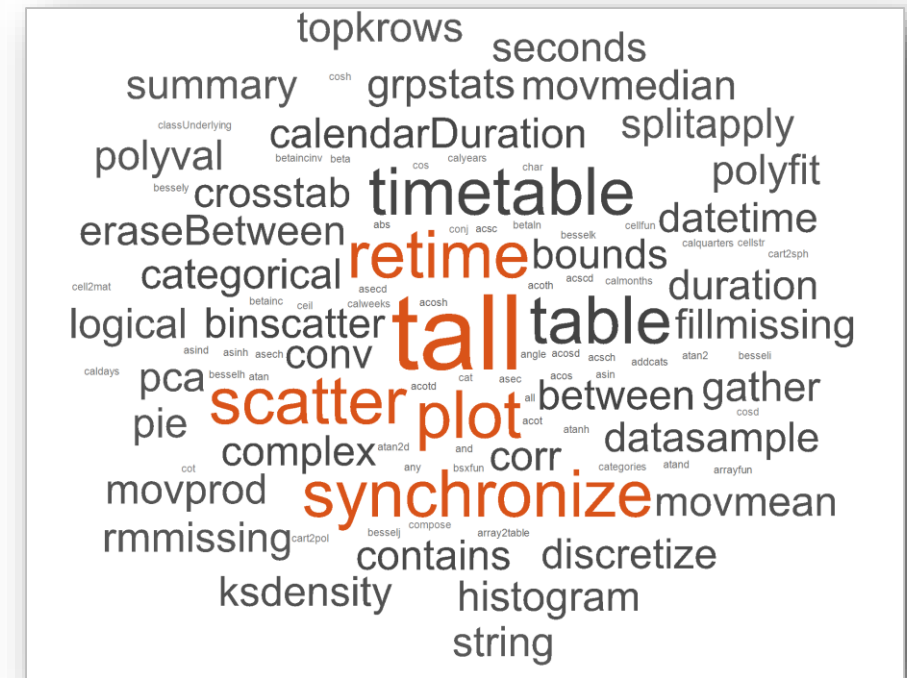
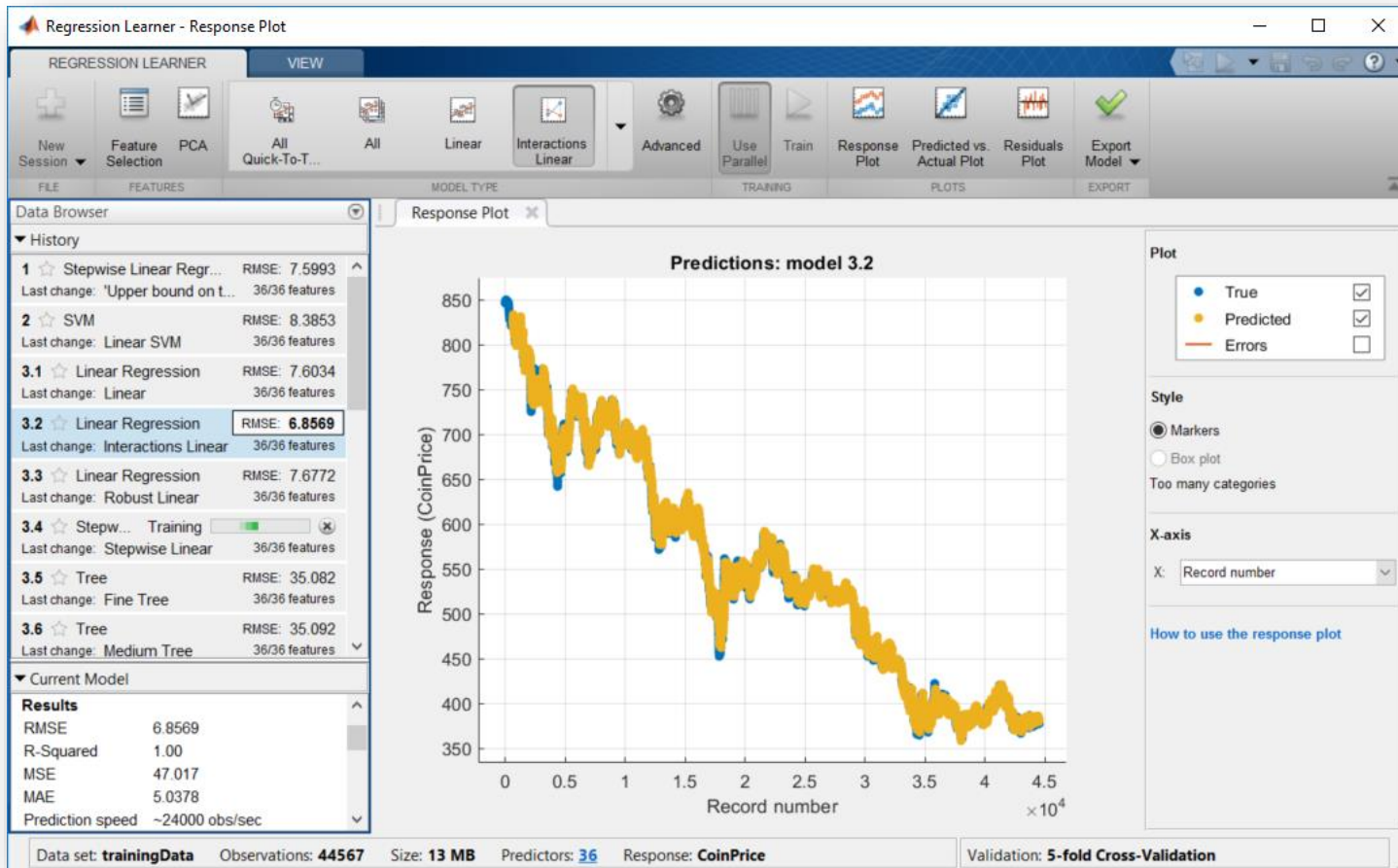


**IT
Professionals**

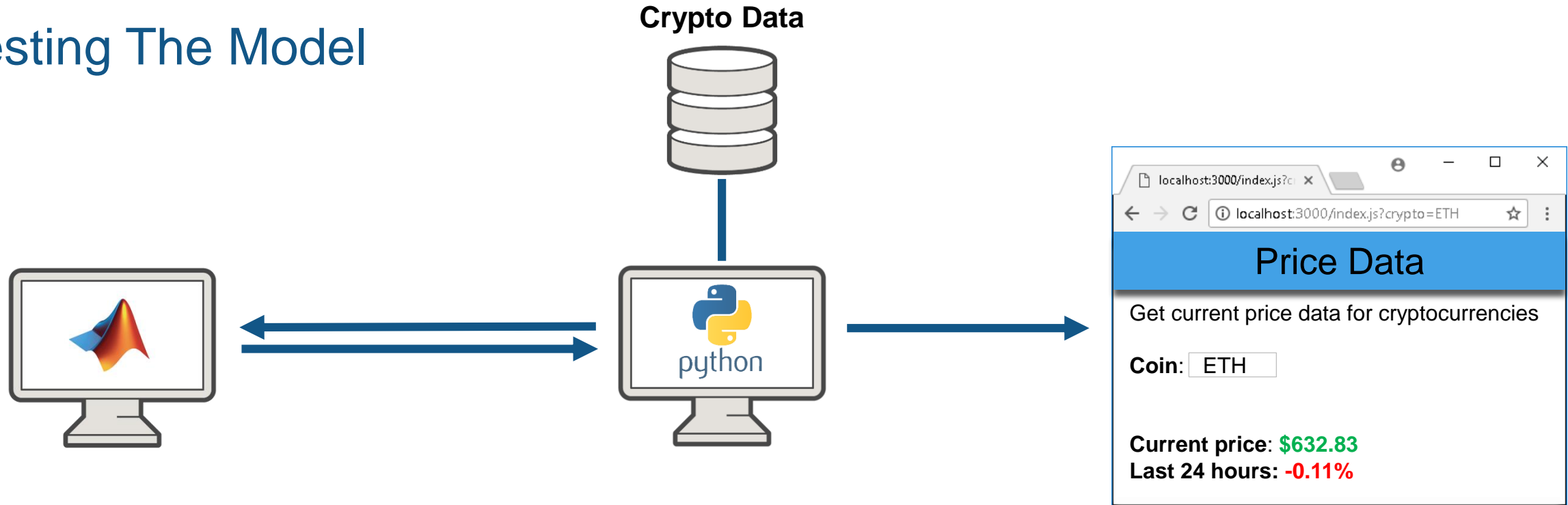


**Business
Users**

Prediction Model Development



Testing The Model



**Model
Developers**

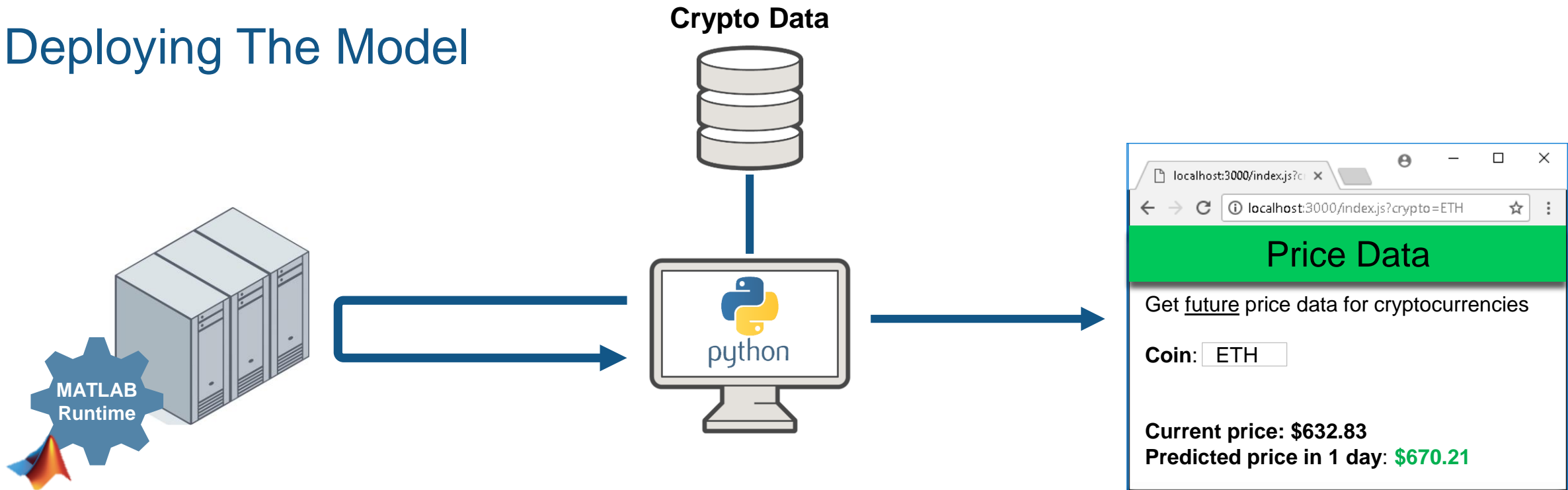


**IT
Professionals**



**Business
Users**

Deploying The Model



**Model
Developers**

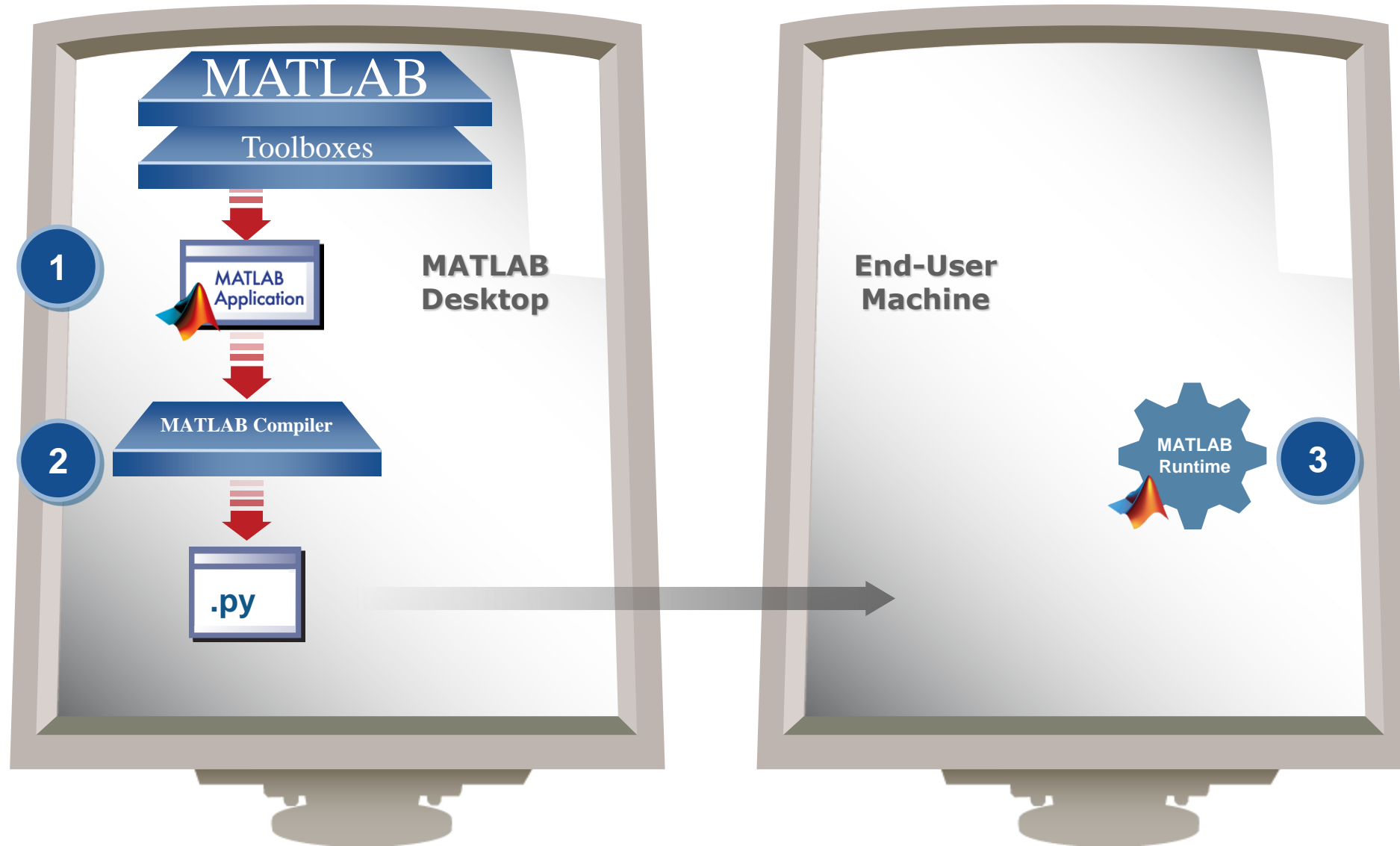


**IT
Professionals**



**Business
Users**

Desktop Deployment with MATLAB



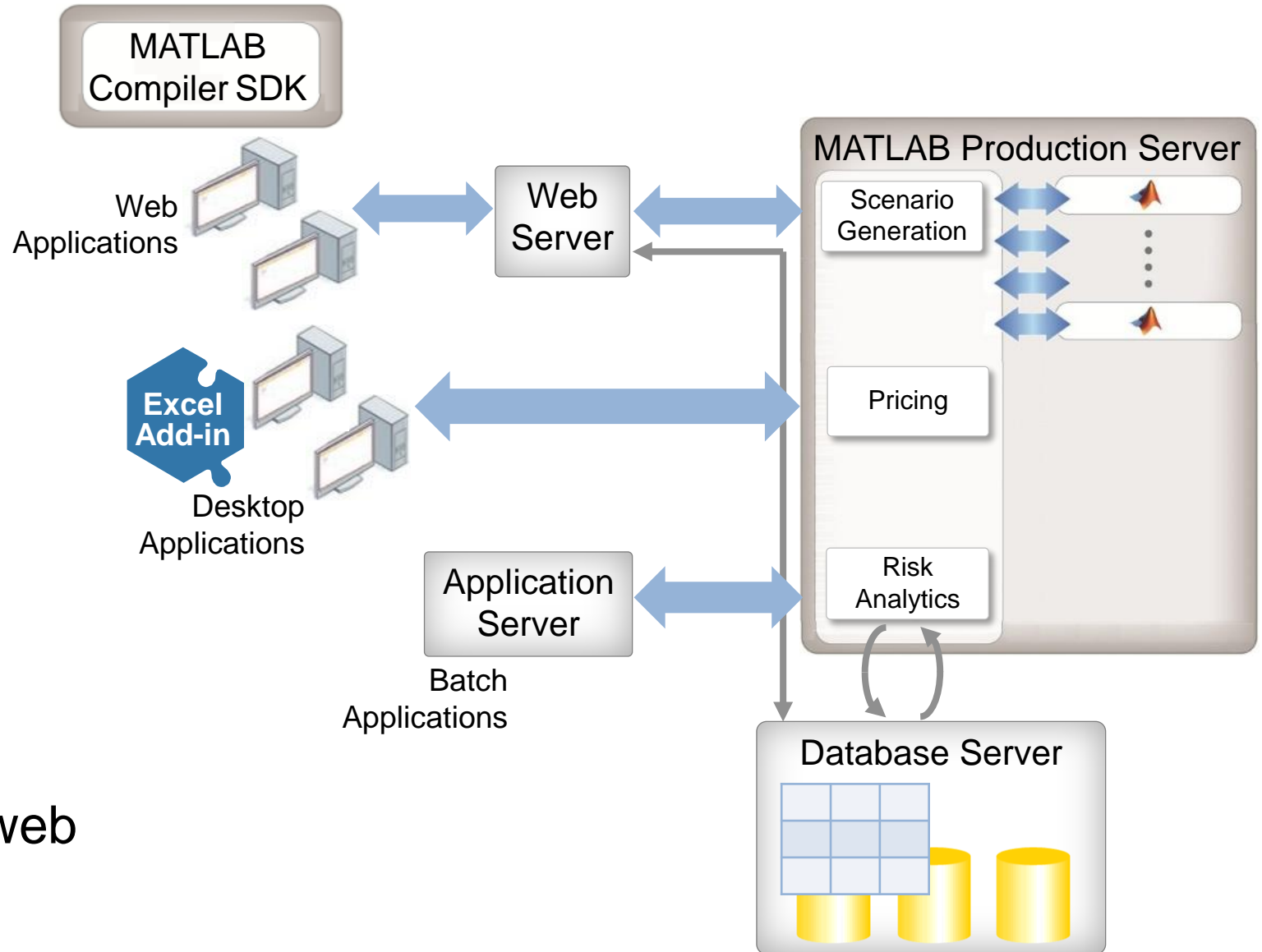
Enterprise Challenges

- Responding to new requirements
- Maintaining software version
- Supporting multiple use cases
- Get models into hands of decision makers faster

Enterprise Deployment and Scalability of MATLAB

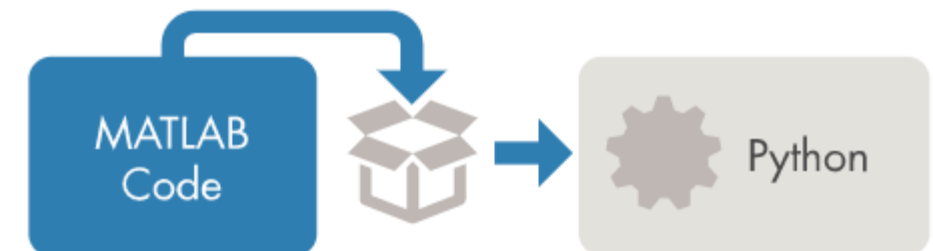


- C/C++
- Java
- C# and .NET
- Python
- Excel
- COM Automation Server
- RESTful, HTTP, and WSDL web services



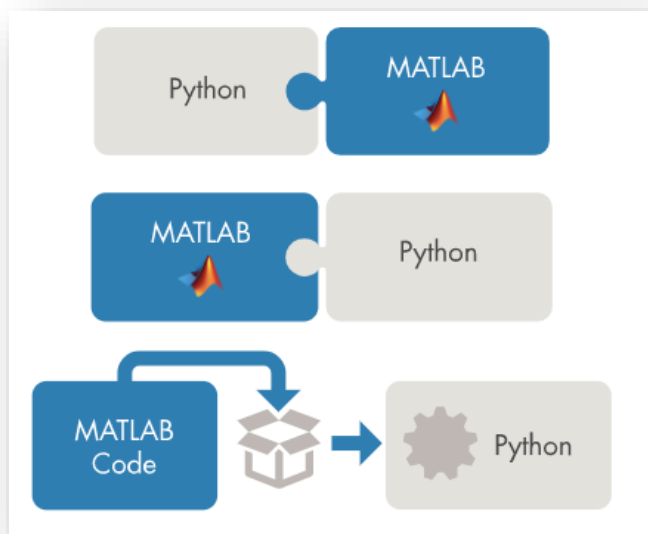
Summary: Using MATLAB with Python

- Calling IT-managed libraries in Python from MATLAB
 - MATLAB
- Calling MATLAB's predictive analytics from Python
 - MATLAB
- Packaging MATLAB applications for scalable deployment with Python
 - Desktop: MATLAB Compiler SDK
 - Enterprise: MATLAB Production Server



Additional Resources

- MATLAB and Python
 - <https://www.mathworks.com/solutions/matlab-and-python.html>
- Predictive Analytics
 - <https://www.mathworks.com/discovery/predictive-analytics.html>
- Deep Learning
 - <https://www.mathworks.com/discovery/deep-learning.html>



The image shows two overlapping promotional banners for MathWorks ebooks. The left banner is titled "Mastering Machine Learning: A Step-by-Step Guide with MATLAB" and features a "Download ebook" button. The right banner is titled "Introducing Deep Learning with MATLAB" and also features a "Download ebook" button. Both banners include the MathWorks logo at the top.

