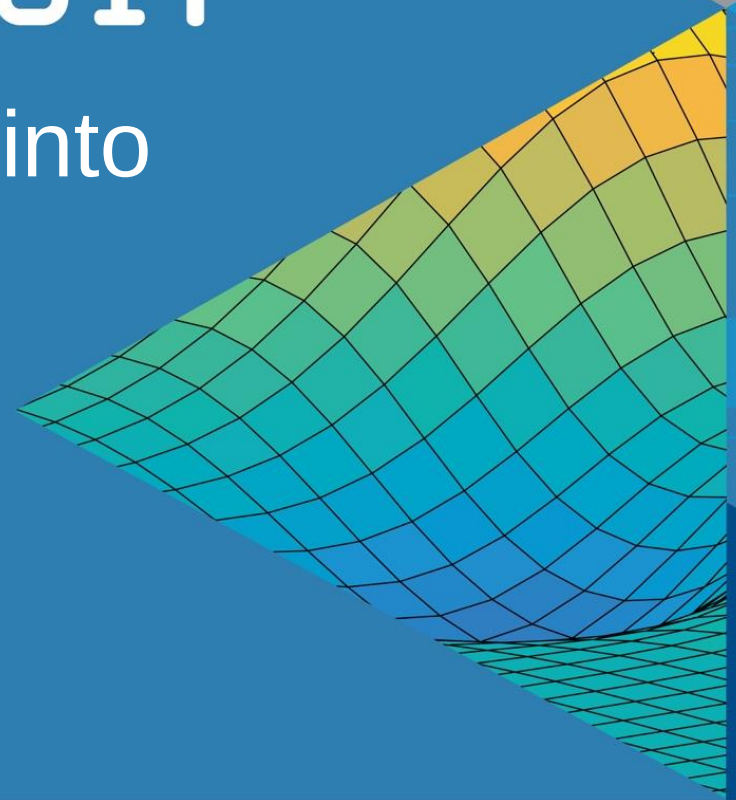
MATLAB EXPO 2017

Integrate MATLAB Analytics into Enterprise Applications

Ionut Barbu, Application Engineer



Data Analytics Workflow

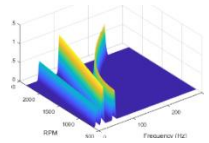
Access and Explore Data

Business Data

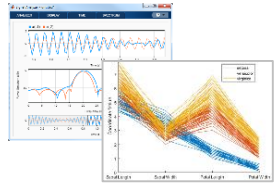
Sensor Data

Preprocess Data

Data Reduction/ Transformation



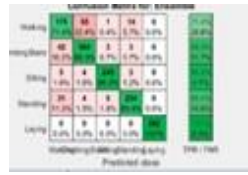
Feature Extraction



Develop Predictive Models

Model Creation

Model Validation



Integrate Analytics with Systems

Enterprise Systems

MATLAB Excel .NET .exe C/C++ Java .dll

Embedded Devices

MATLAB: Single Platform

Data Analytics Workflow

Access and Explore Data

Preprocess Data

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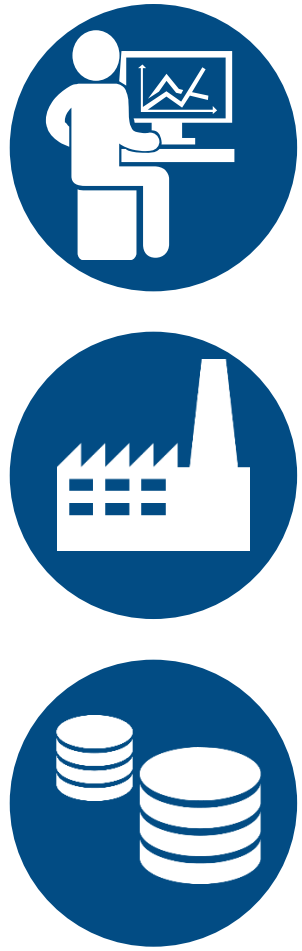
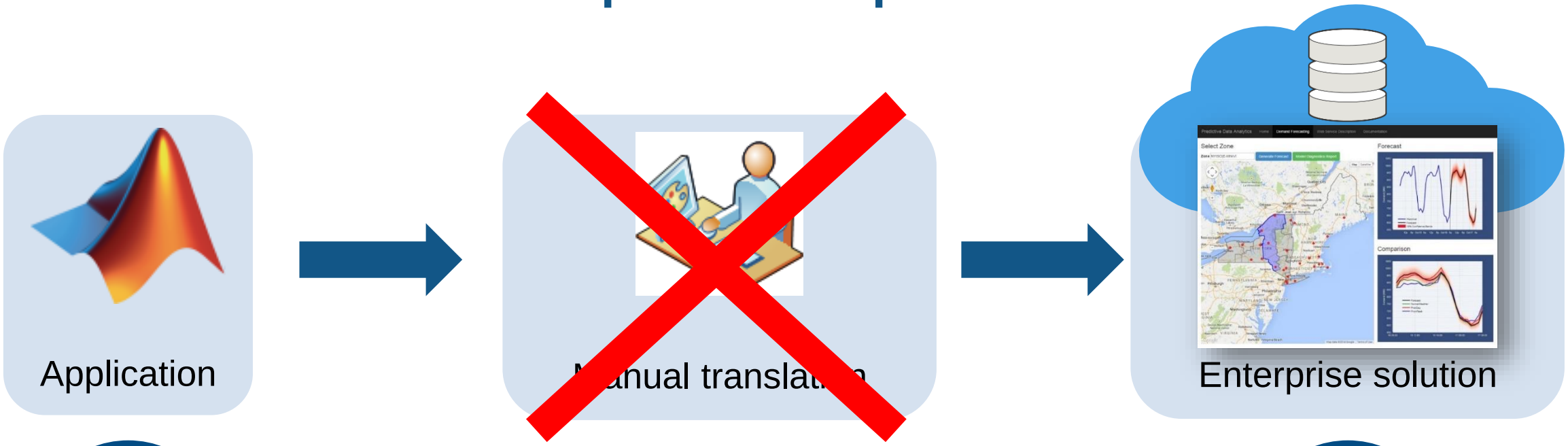
MATLAB: Single Platform

Challenges

- Bridge the gap between multiple disciplines
- Integrate solutions to enterprise scale frameworks
- Deliver fast results with large volumes of data



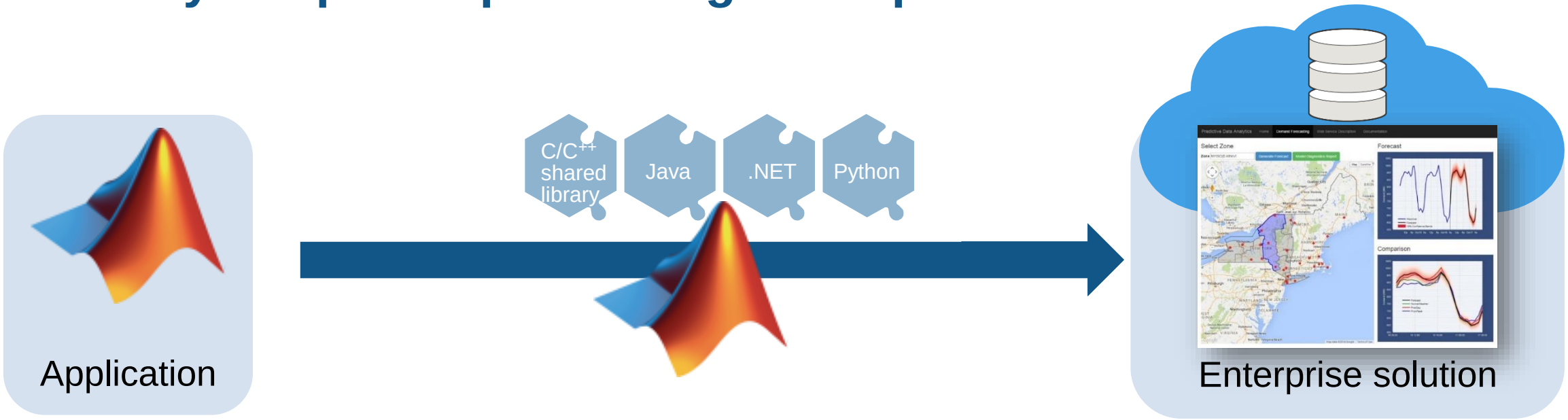
Different tools for development and productization



Domain Expert

Solution Architect

What if you speed up the integration process?



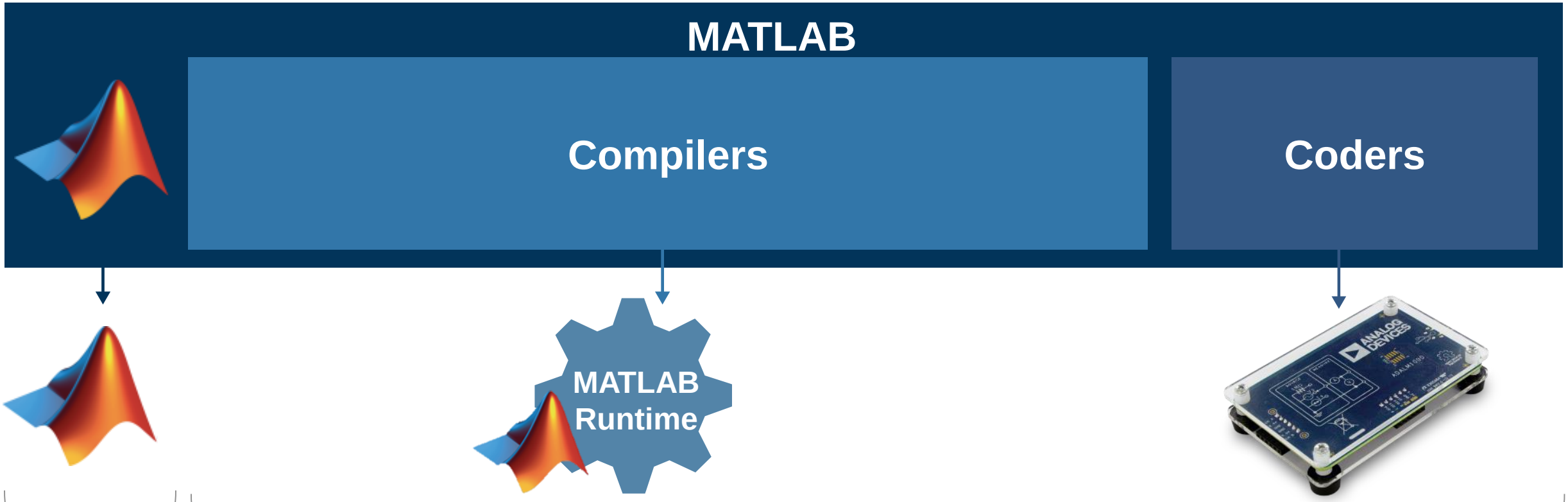
with automatic deployment

Domain Expert

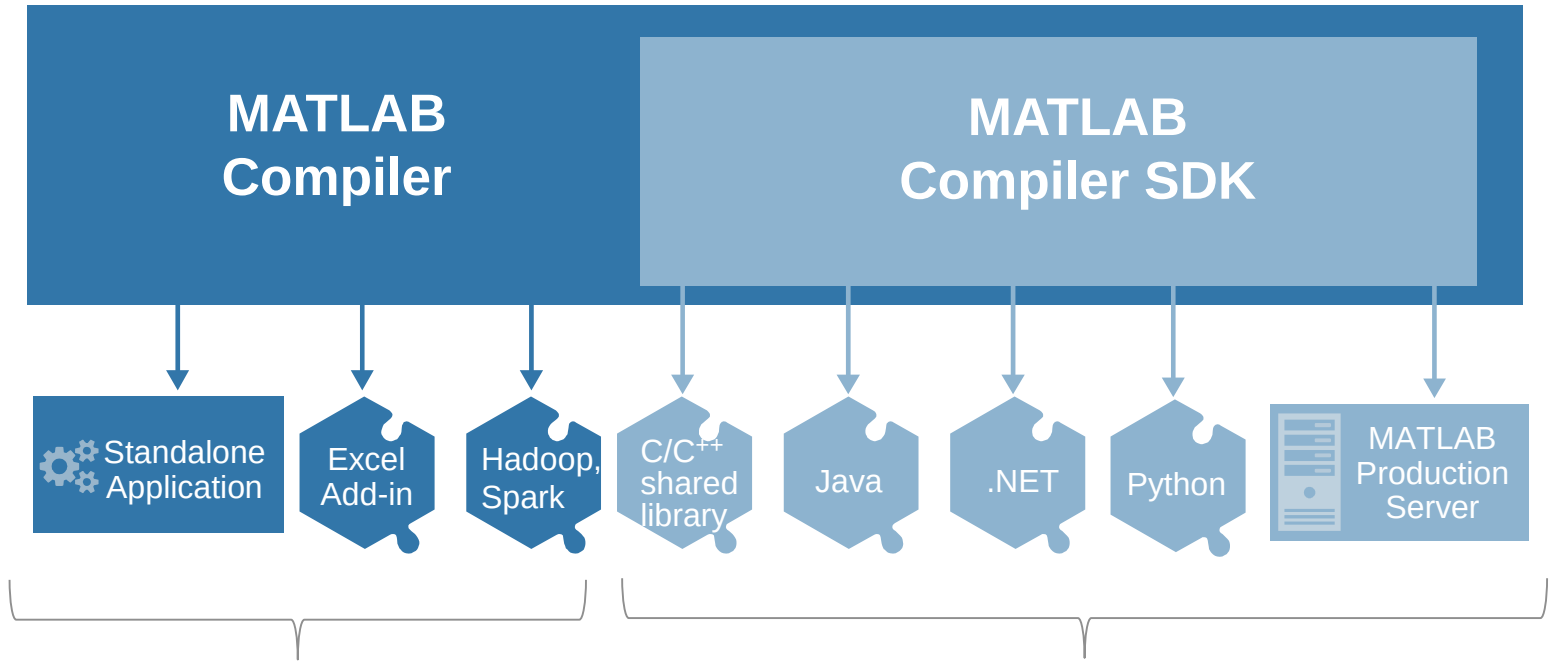
Solution Architect

Sharing and Deploying MATLAB Applications

Write Your Programs Once, Then Share to Different Targets



Share with People Who Do Not Have MATLAB



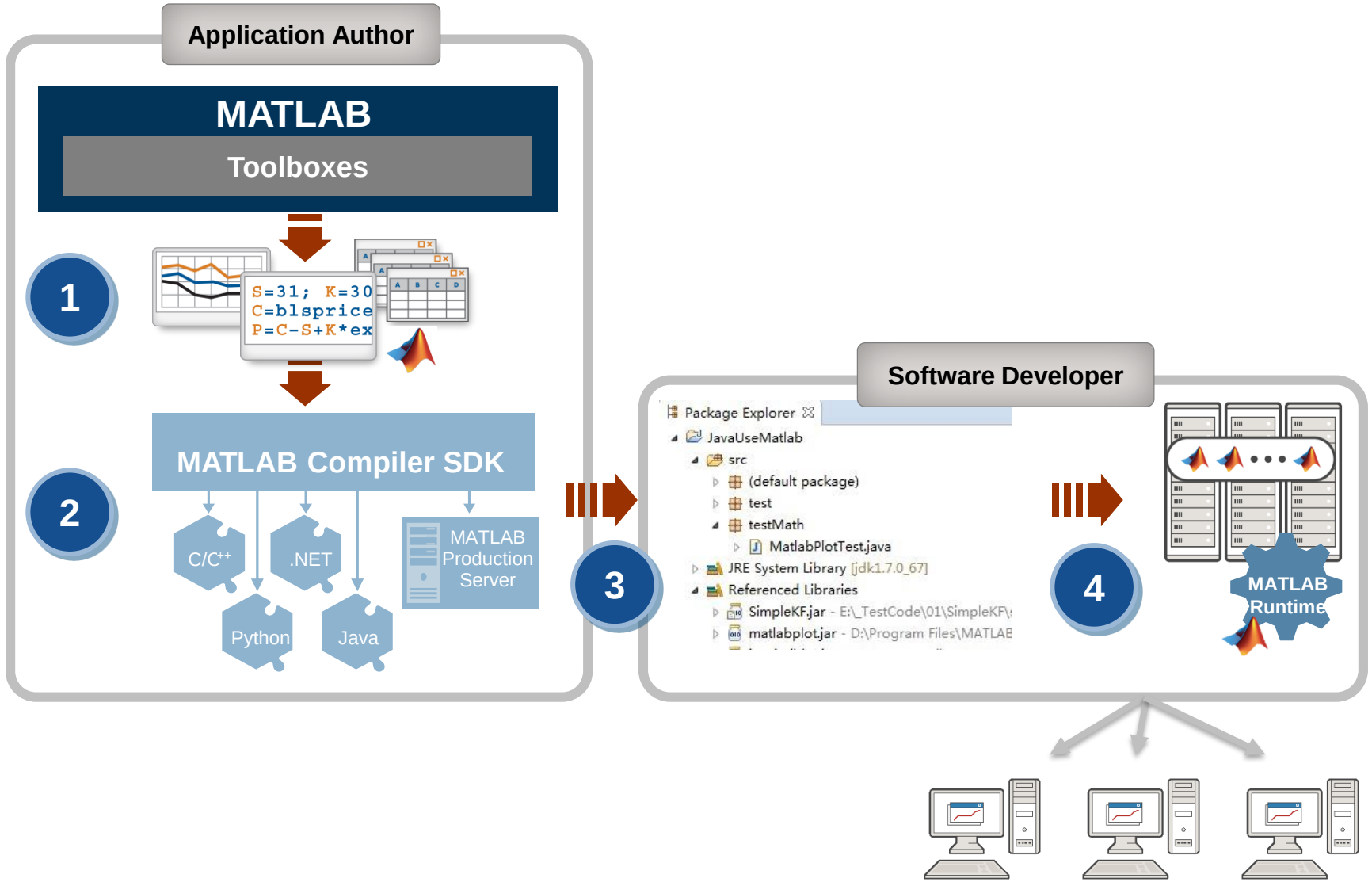
Share Applications with No Additional Programming

Integrate MATLAB-based Components With Your Own Software

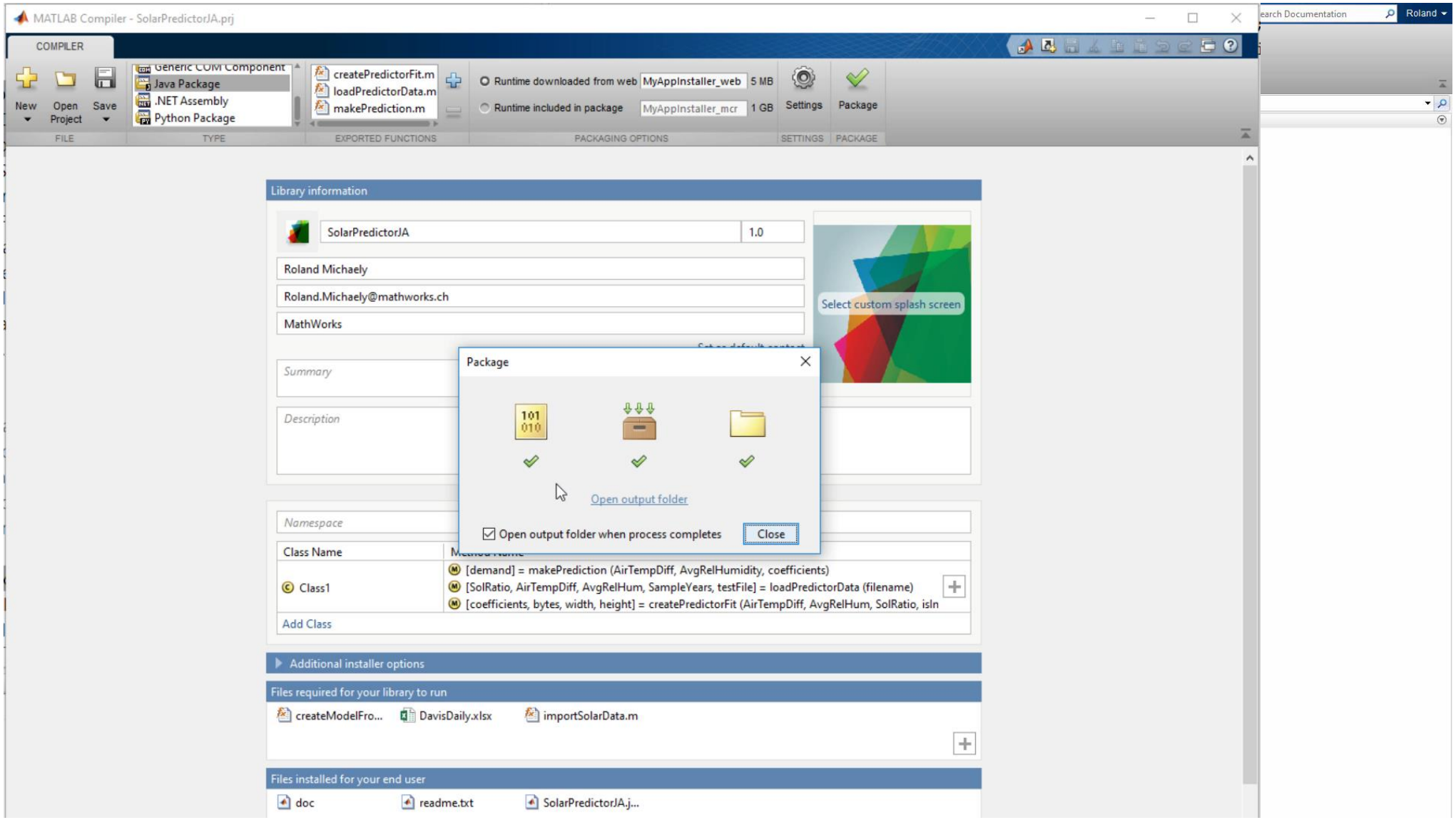
MATLAB Runtime

- Royalty-free Sharing
- IP Protection via Encryption

Integrate MATLAB-based Components With Your Own Software



Using MATLAB Compiler SDK to create Java Classes



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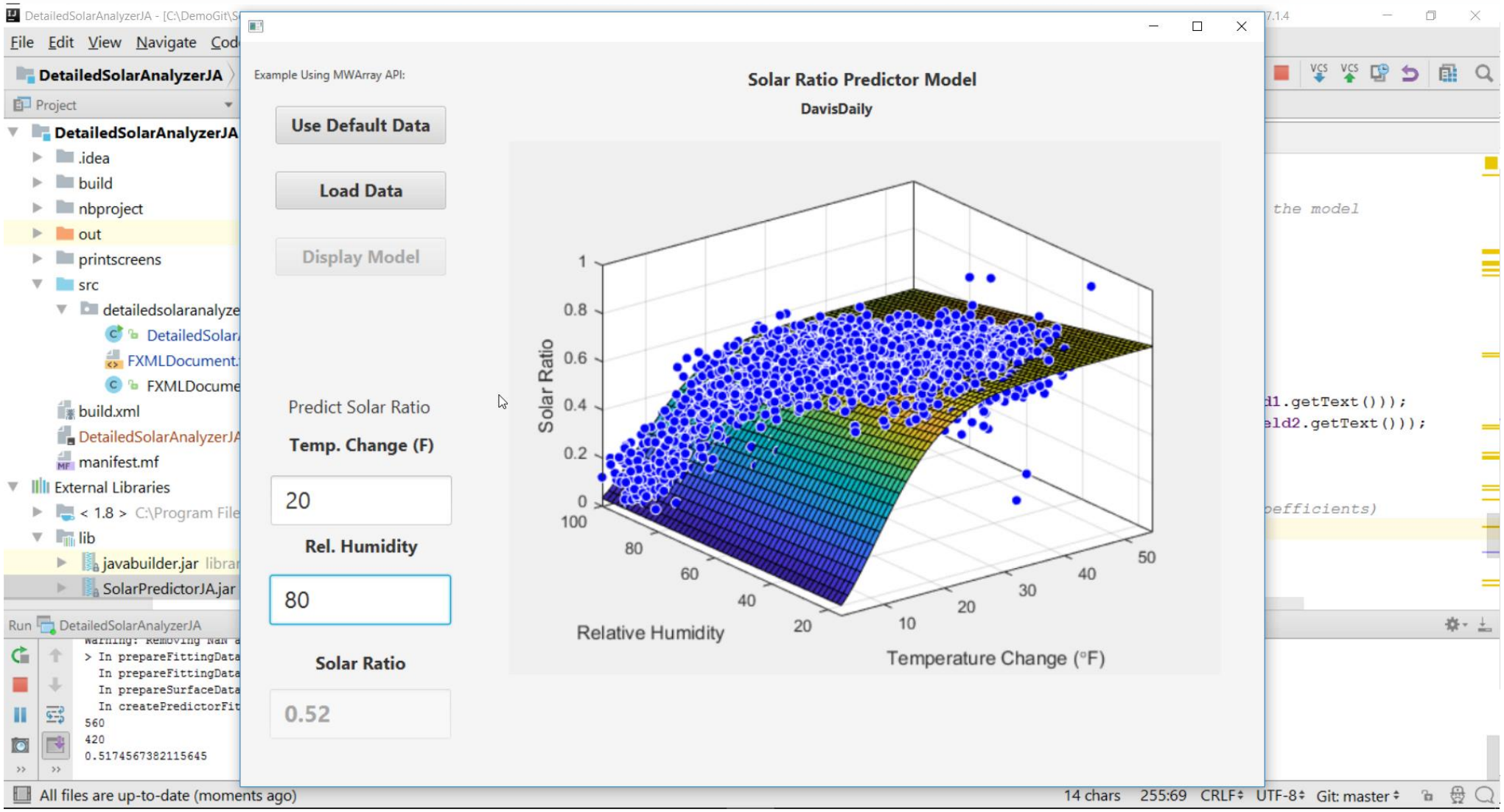
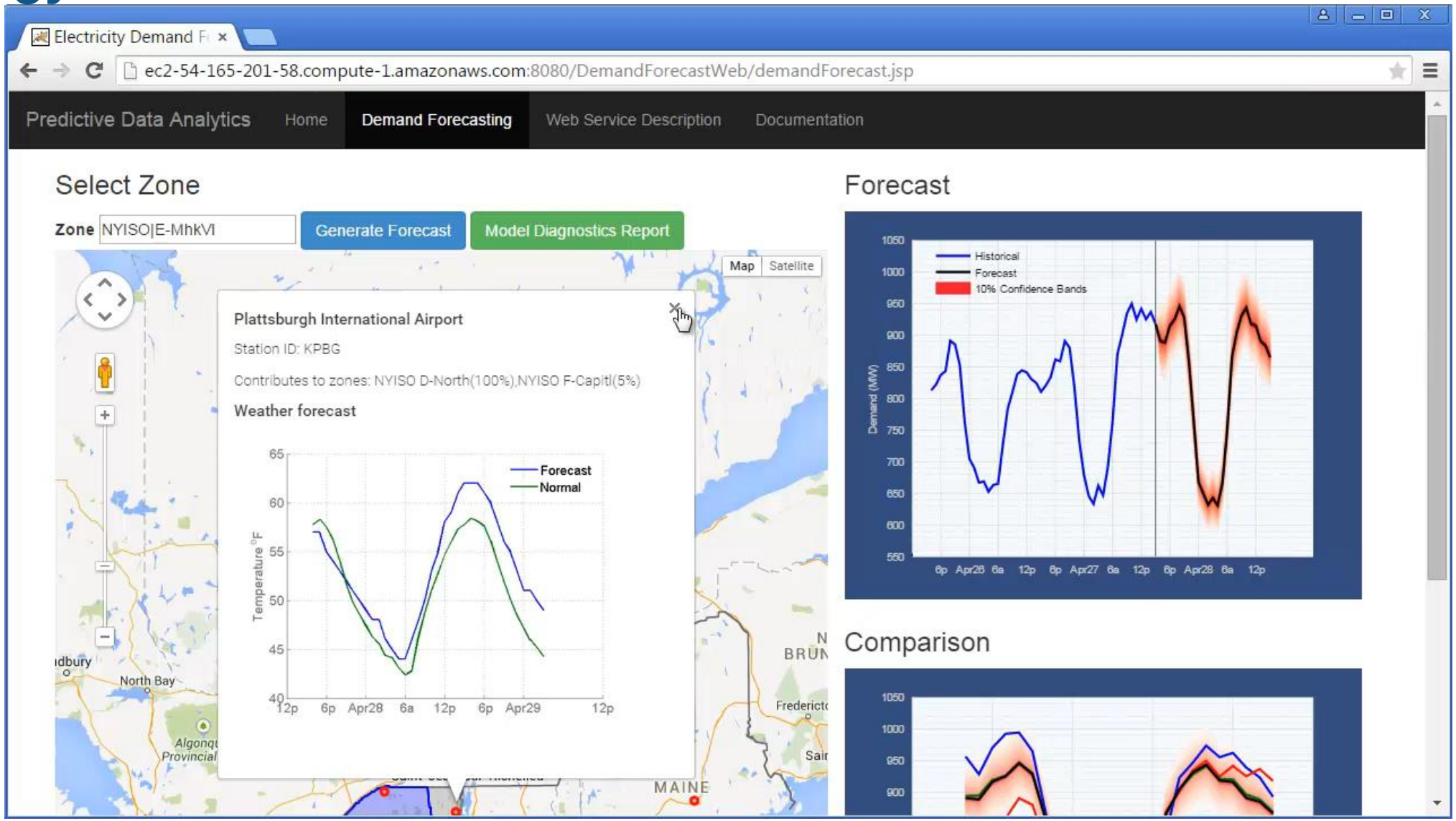


MATLAB *and MATLAB Production Server*

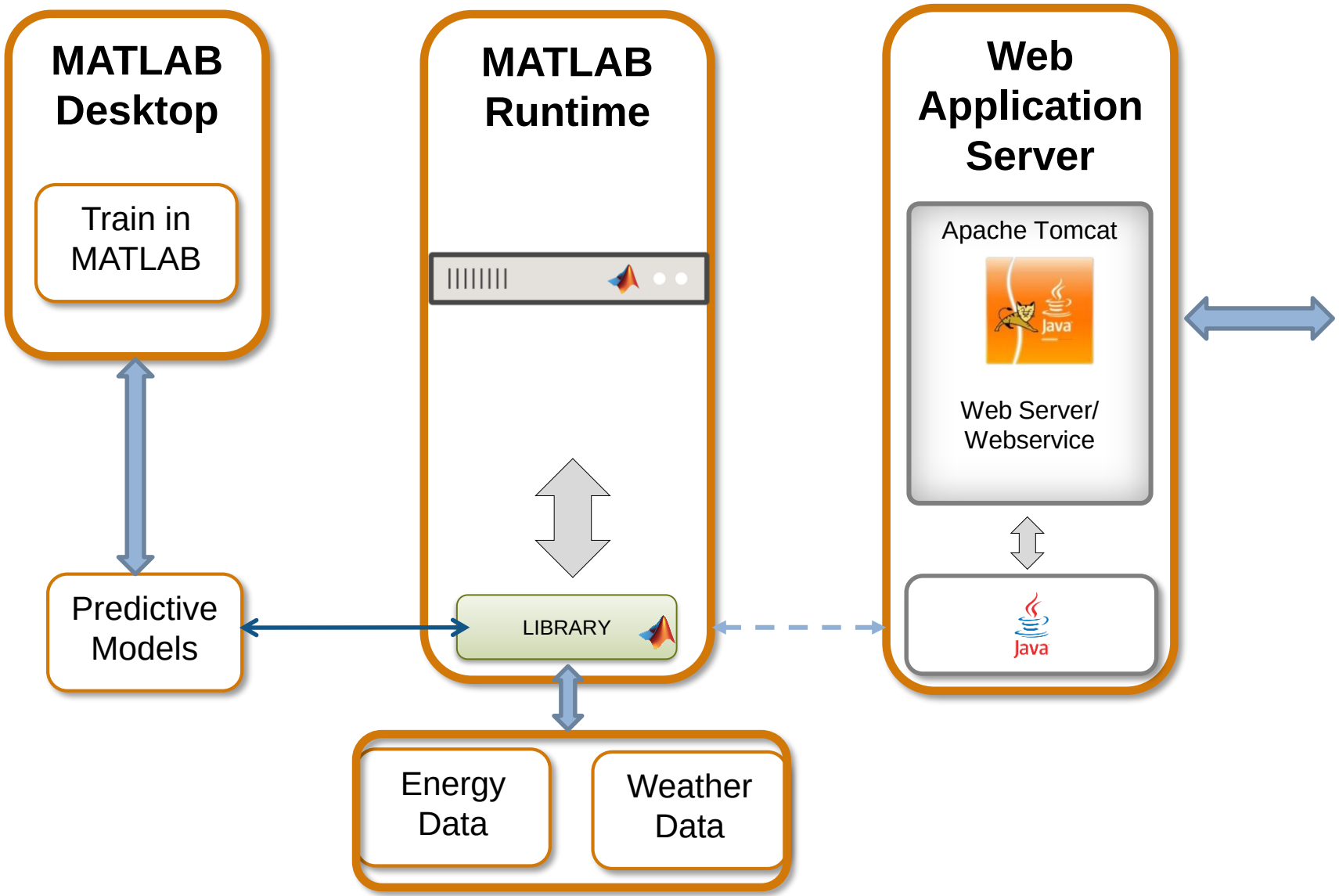
is the easiest and most productive environment to *take your enterprise analytics* or *Internet of Things solution* from idea to production

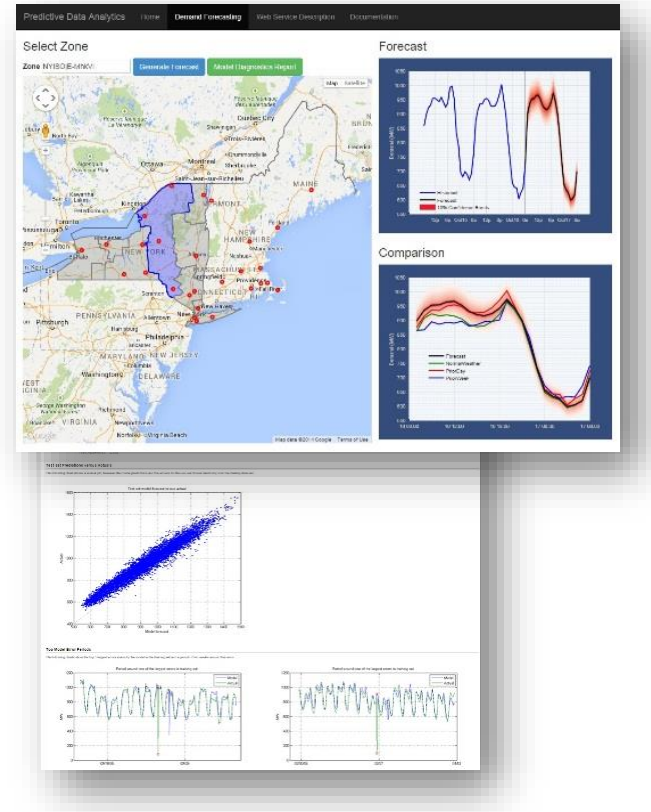
Idea **Production**

Energy Load Forecast

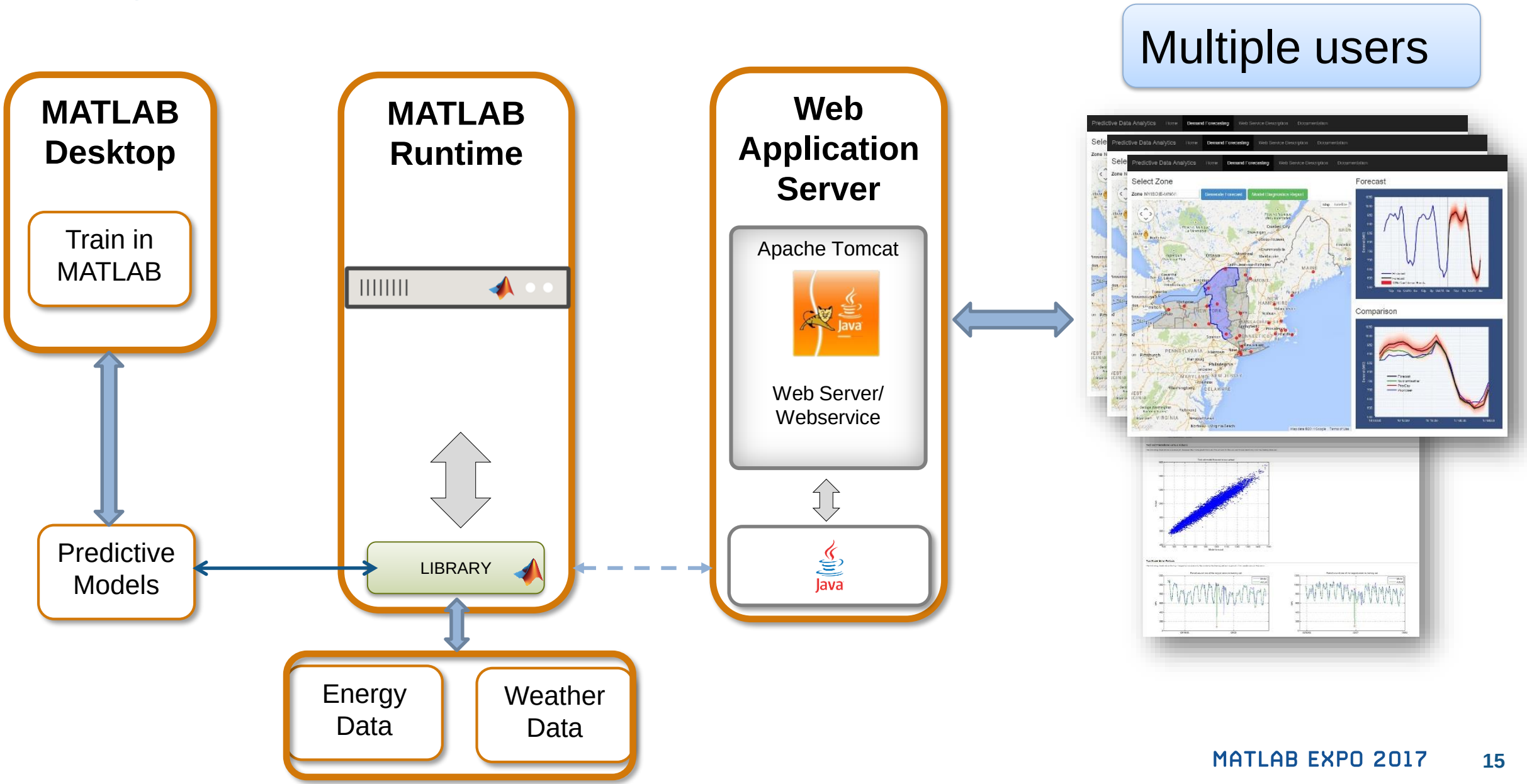


Energy Load Forecast

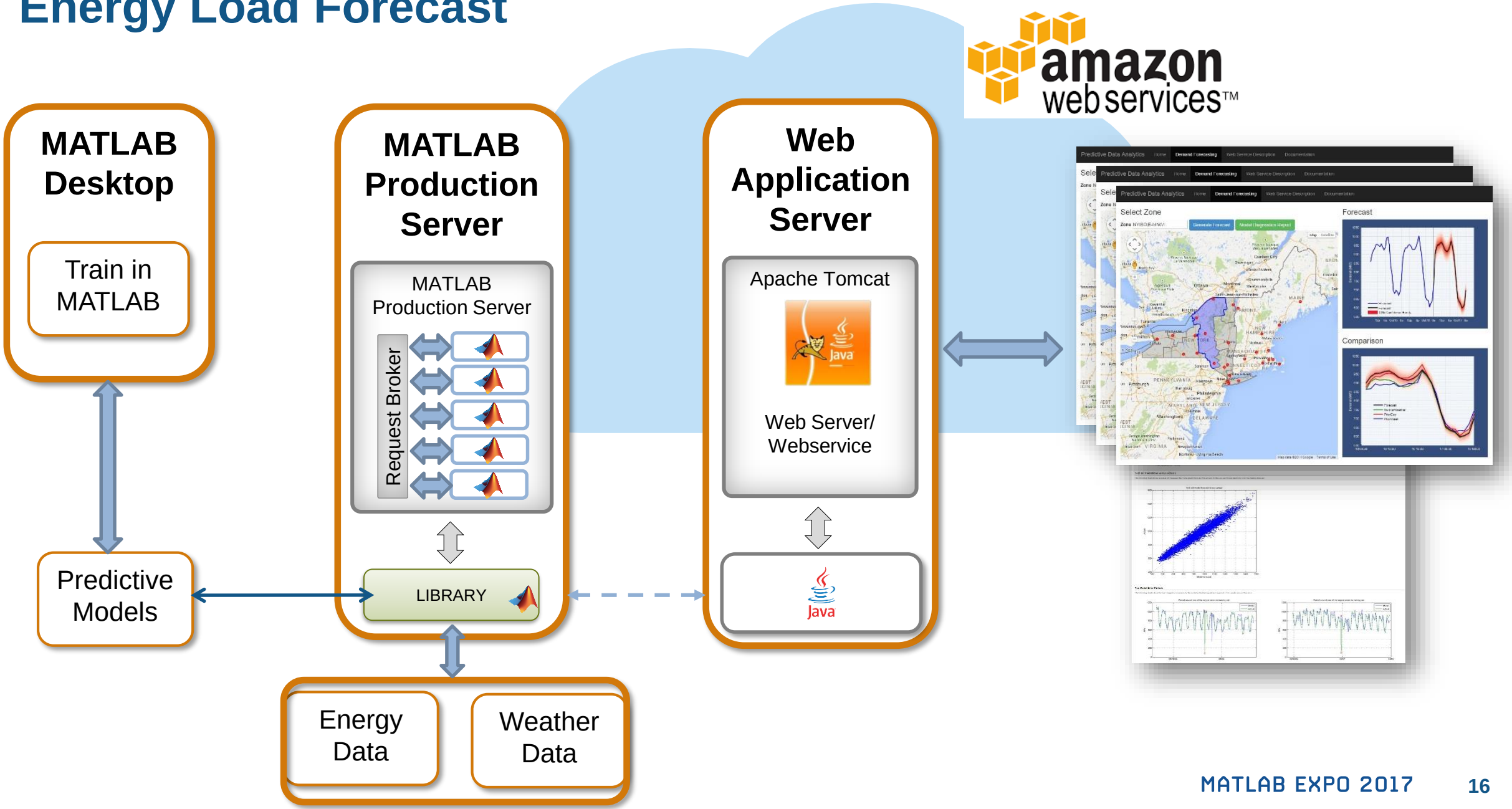




Energy Load Forecast



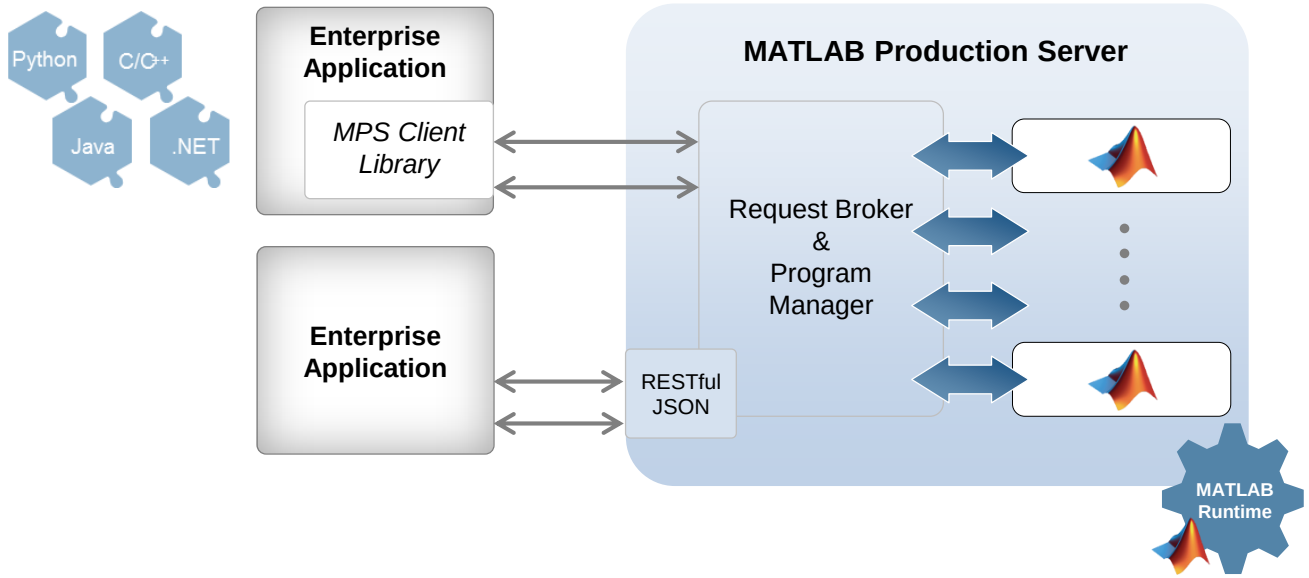
Energy Load Forecast



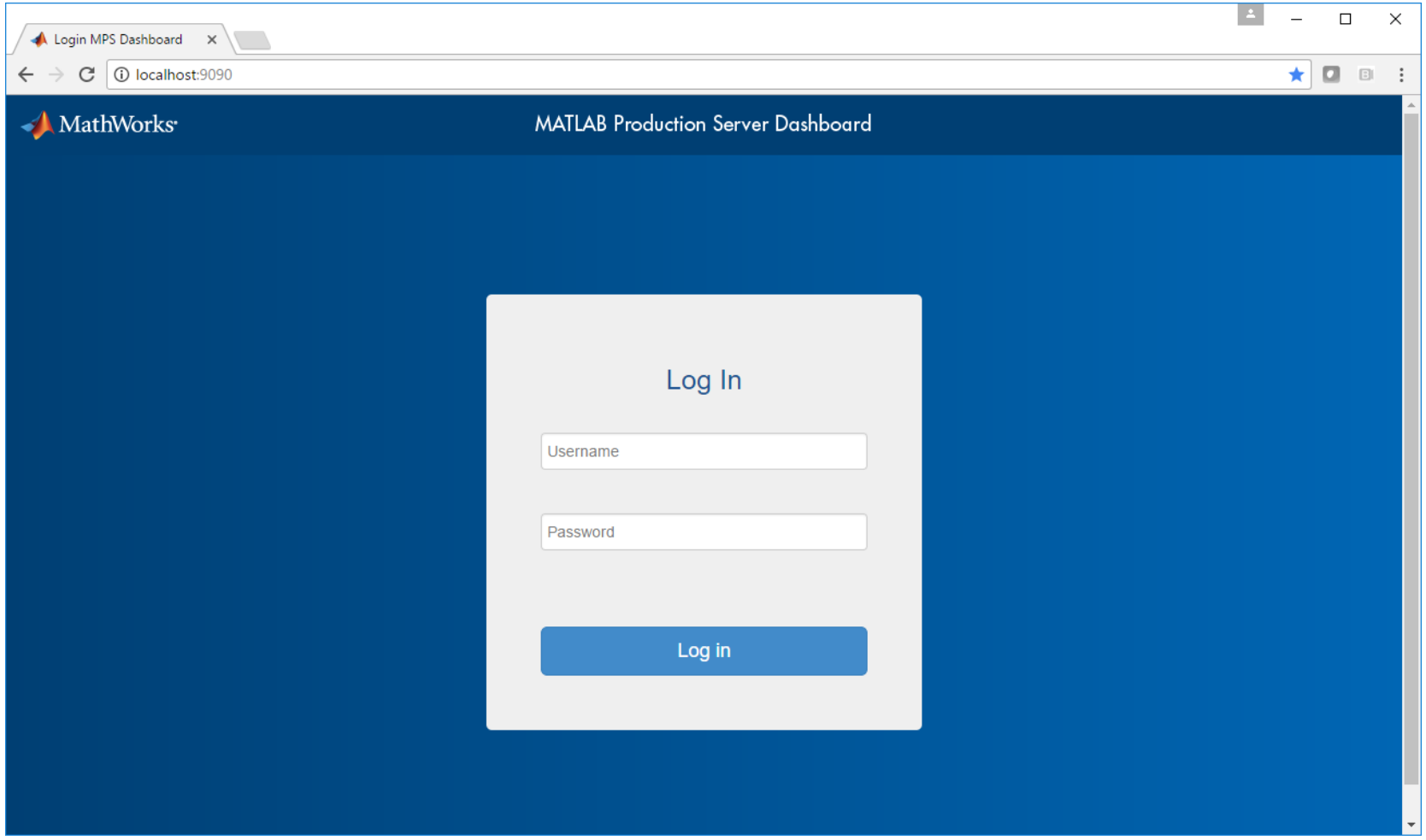
MATLAB Production Server

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)



Manage Your Server Instances Using a Dashboard Interface



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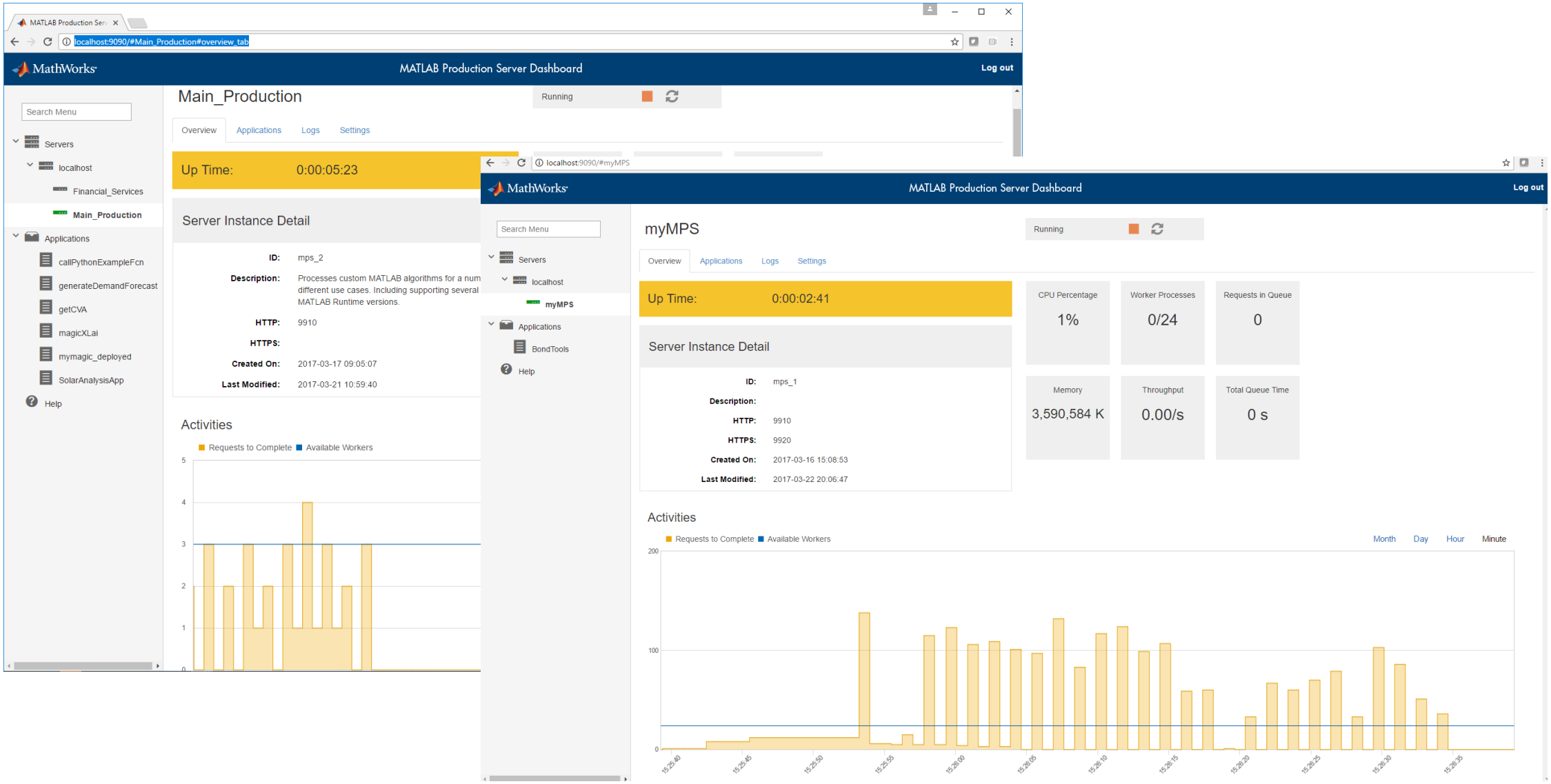
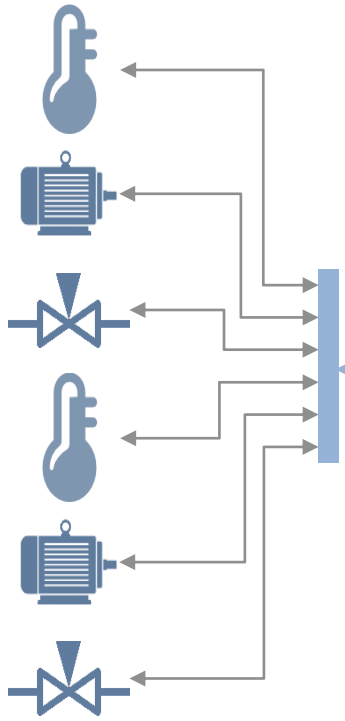


Building Automation IoT Analytics on Azure

Building/HVAC automation control system

- Variety of sensors and controls
- Networked communication
- Data reduction



Microsoft Azure

MATLAB Production Server

Request Broker

Azure EventHub

Azure Blob

Azure SQL

Global heavy duty electrical equipment manufacturer

Business Systems

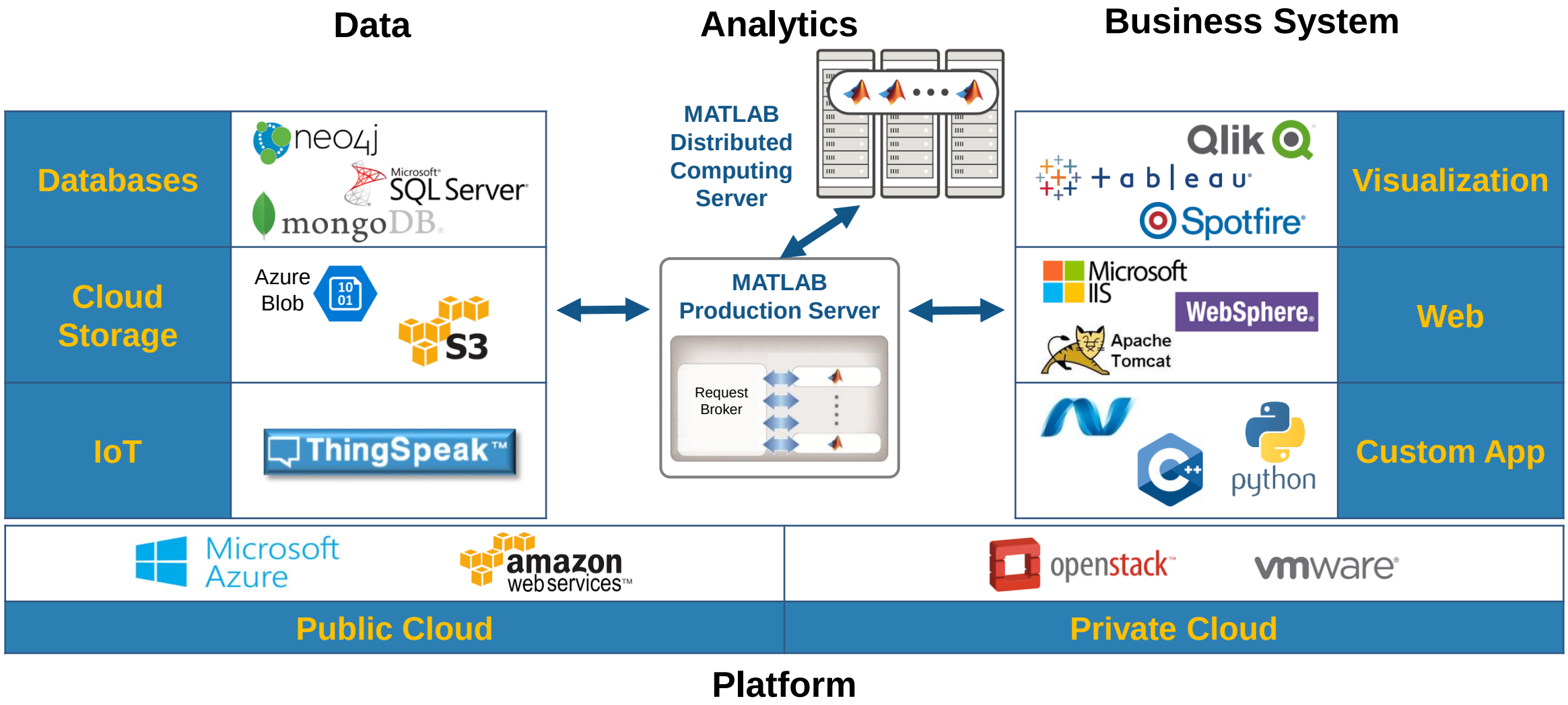
Users

MATLAB Compiler SDK

MATLAB

Algorithm Developers

Technology Stack



Front-end Scalability

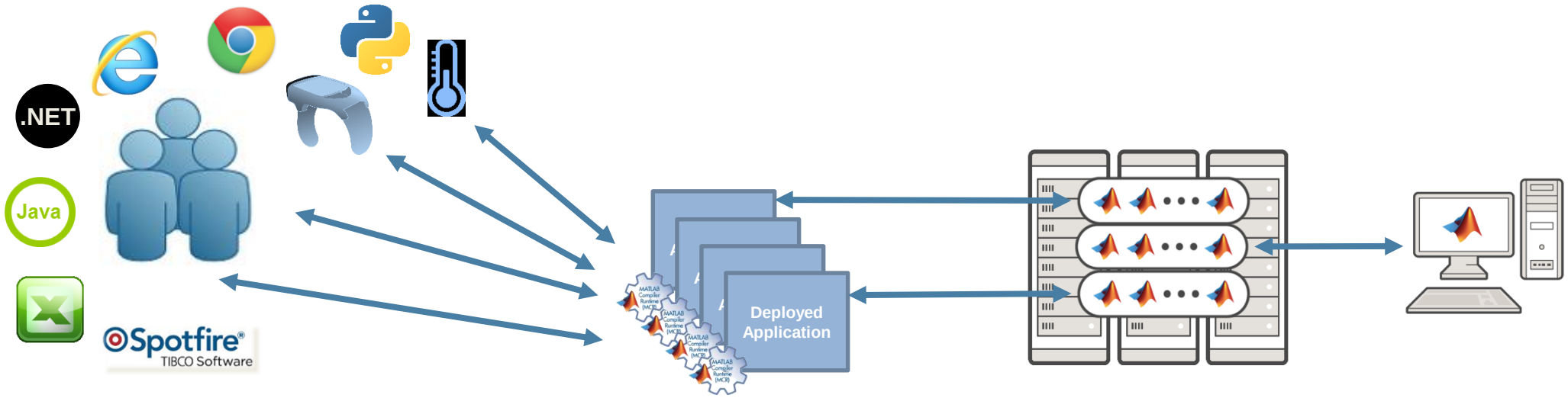
Application server for MATLAB

- Manage large numbers of requests to run deployed MATLAB programs

Back-end Scalability

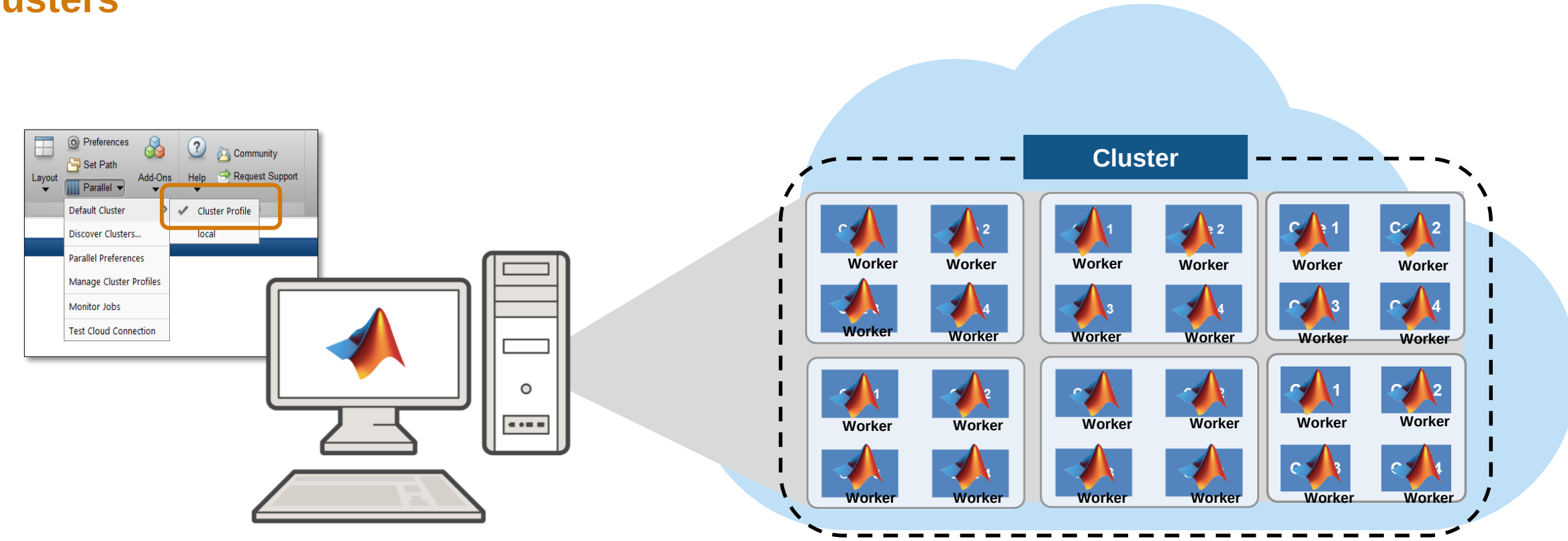
Cluster framework for MATLAB

- Speed up computationally intensive programs on computer clusters, clouds, and grids



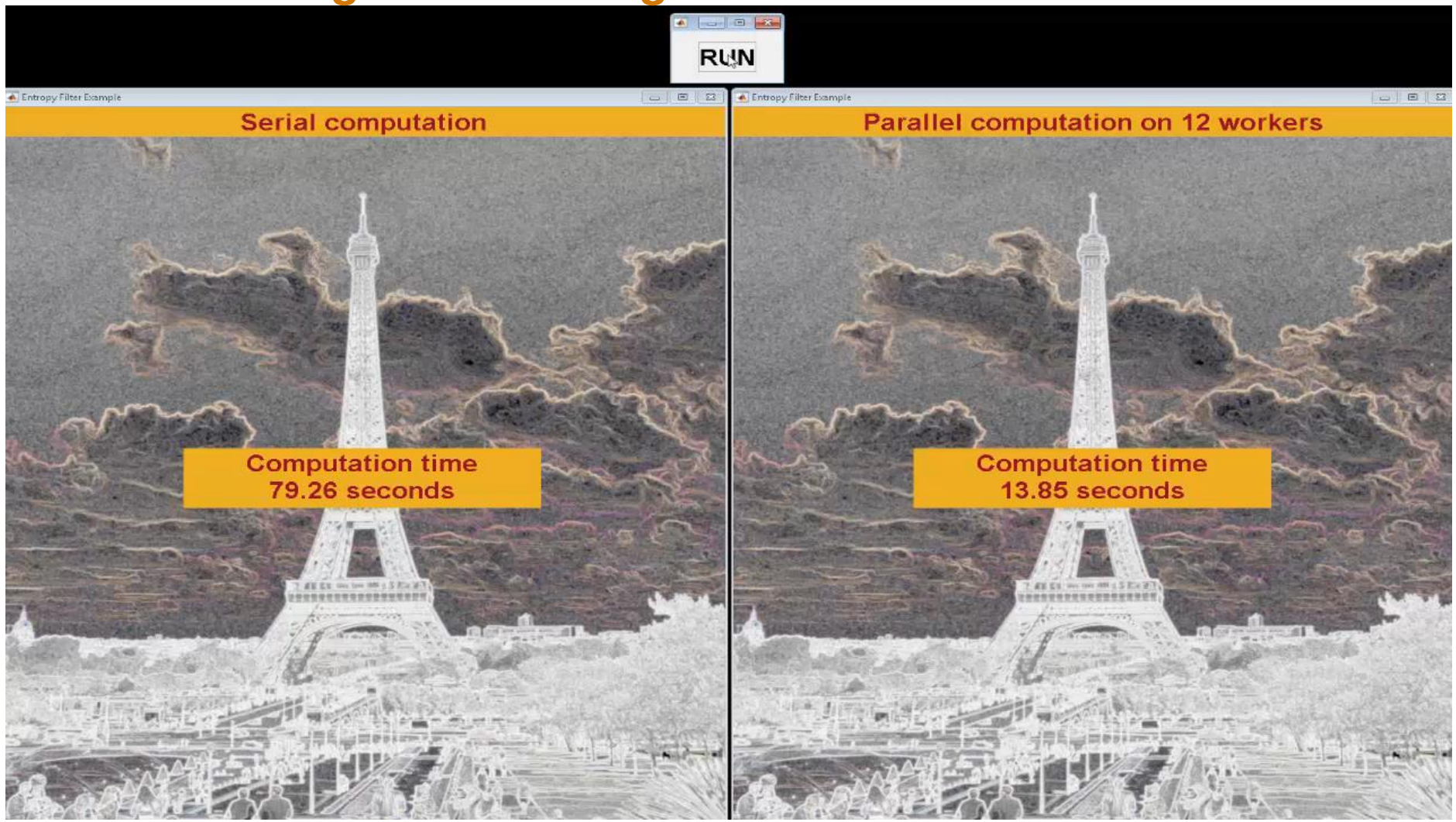
Parallel Computing Paradigm

Clusters

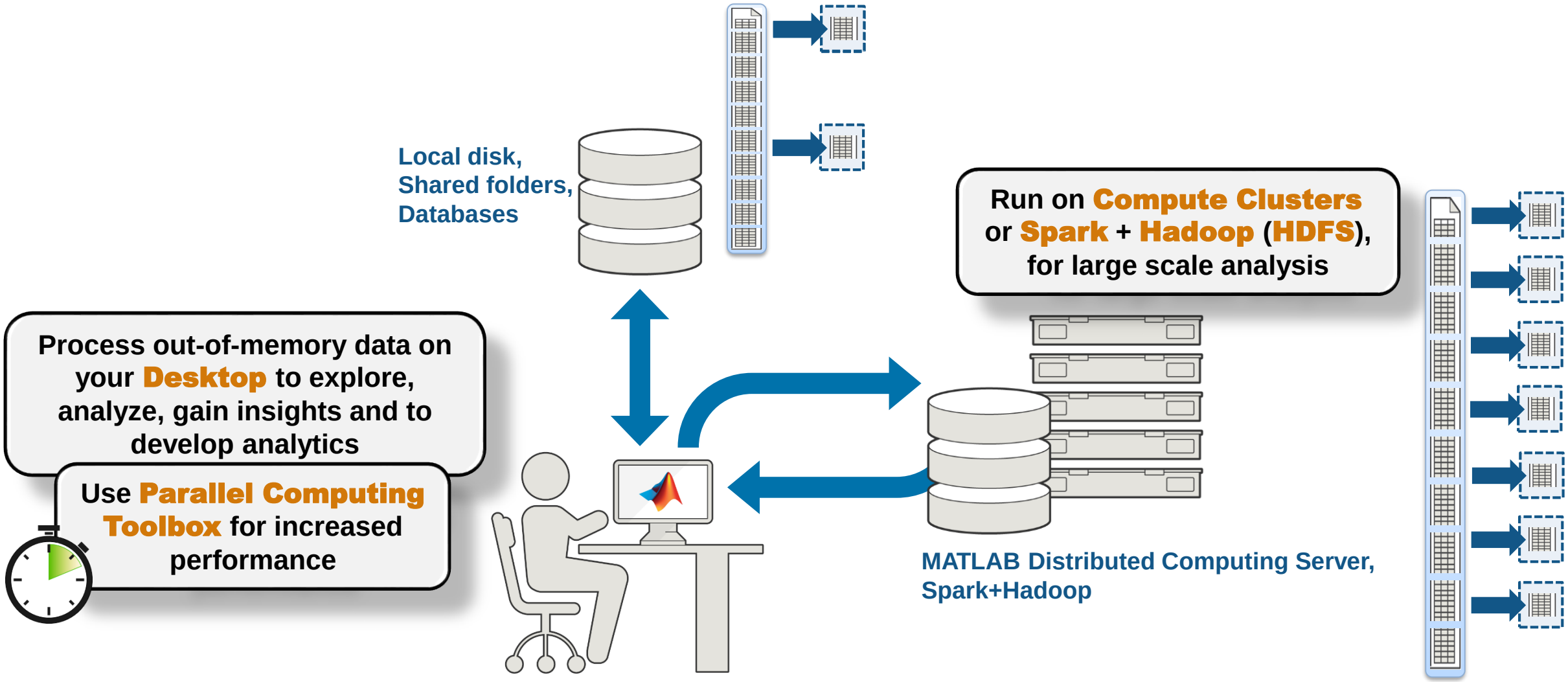


Speed-up using Multiple Cores on the Cloud

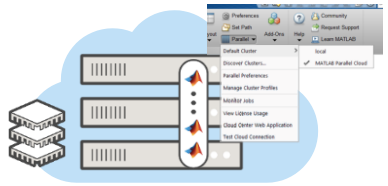
High Resolution Image Processing

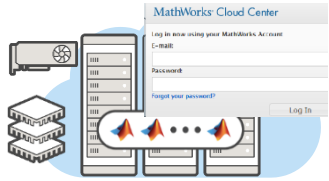


Big Data Workflow



Scale your Applications Beyond the Desktop

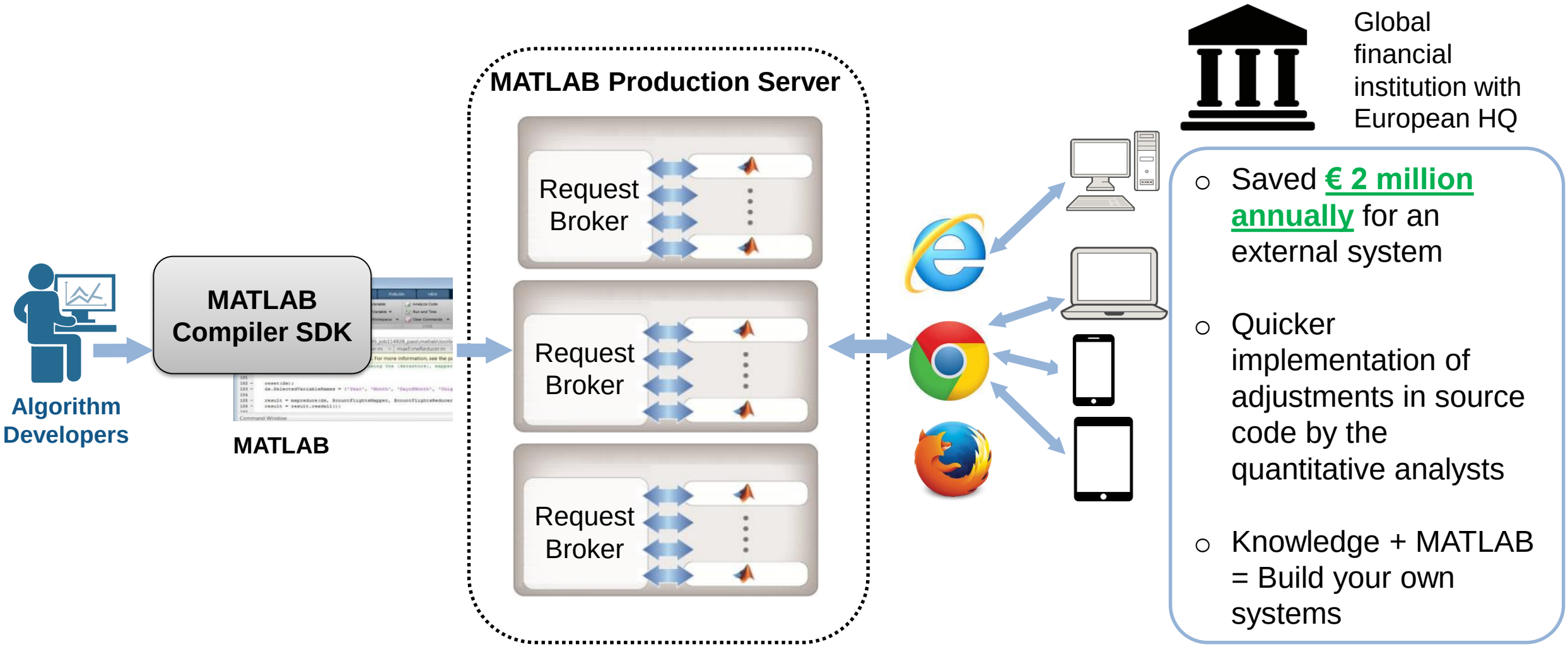




Option	Parallel Computing Toolbox	MATLAB Parallel Cloud	MATLAB Distributed Computing Server *for Amazon EC2*	MATLAB Distributed Computing Server *for Custom Cloud*	MATLAB Distributed Computing Server
Description	Explicit desktop scaling	Single-user, basic scaling to cloud	Scale to EC2 with some customization	Scale to custom cloud	Scale to clusters
Maximum workers	No limit	16	256	No limit	No limit
Hardware	Desktop	MathWorks Compute Cloud	Amazon EC2	Amazon EC2, Microsoft Azure, Others	Any
Availability	Worldwide	United States and Canada	United States, Canada and other select countries in Europe	Worldwide	Worldwide

Learn More: Parallel Computing on the Cloud

Customer Example: Financial Customer Advisory Service



How to get started?

- Data Analytics
- Application Development
- Code Generation

MATLAB®

Data Analytics
Data Processing and visualization
Statistics
Machine Learning
Optimization Techniques
Parallel Computing

Application Development
Programming Techniques
Building Interactive Applications
Object-Oriented Programming

Code Generation
MATLAB Coder
Interfacing with C-code

Application-Specific
Control System Design
Signal Processing
Communication Systems
LTE Systems

Computational Finance
Risk Management
Time-Series Modelling

Signal Processing
Using MATLAB
Using Simulink

Image and Video Processing
Image Processing
Computer Vision

SIMULINK®

Model-Based Design
Implementing MBD Workflow
Model Management and Architecture
Verification and Validation

STATEFLOW®
Event-Based Modeling

Simscape™
General Simscape™
Simscape Multibody™
Simscape Drivelime™
Simscape Fluids™
Simscape Power Systems™

Code Generation
Rapid Prototyping and HIL-Simulation
Embedded Systems
FPGA Design
Generating HDL Code
Xilinx Zynqc SoCs
AUTOSAR

Code Integration
Integrating C and MATLAB

Polyspace©
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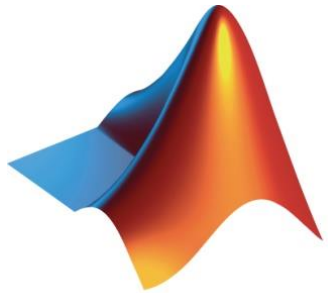

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