

MATLAB EXPO 2017

Integrate MATLAB Analytics into
Enterprise Applications

Aurélie Urbain

MathWorks Consulting Services

Data Analytics Workflow

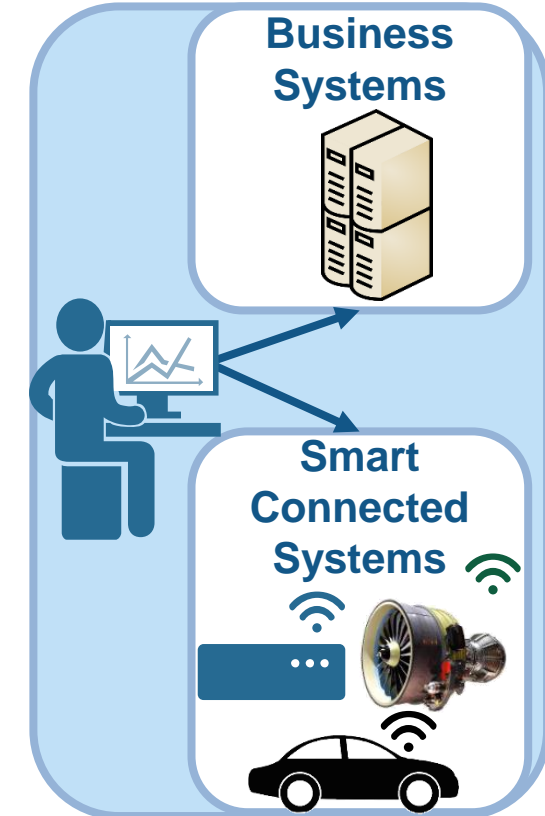
Data Acquisition



Data Analytics



Analytics Integration



MATLAB: Single Platform

Challenges

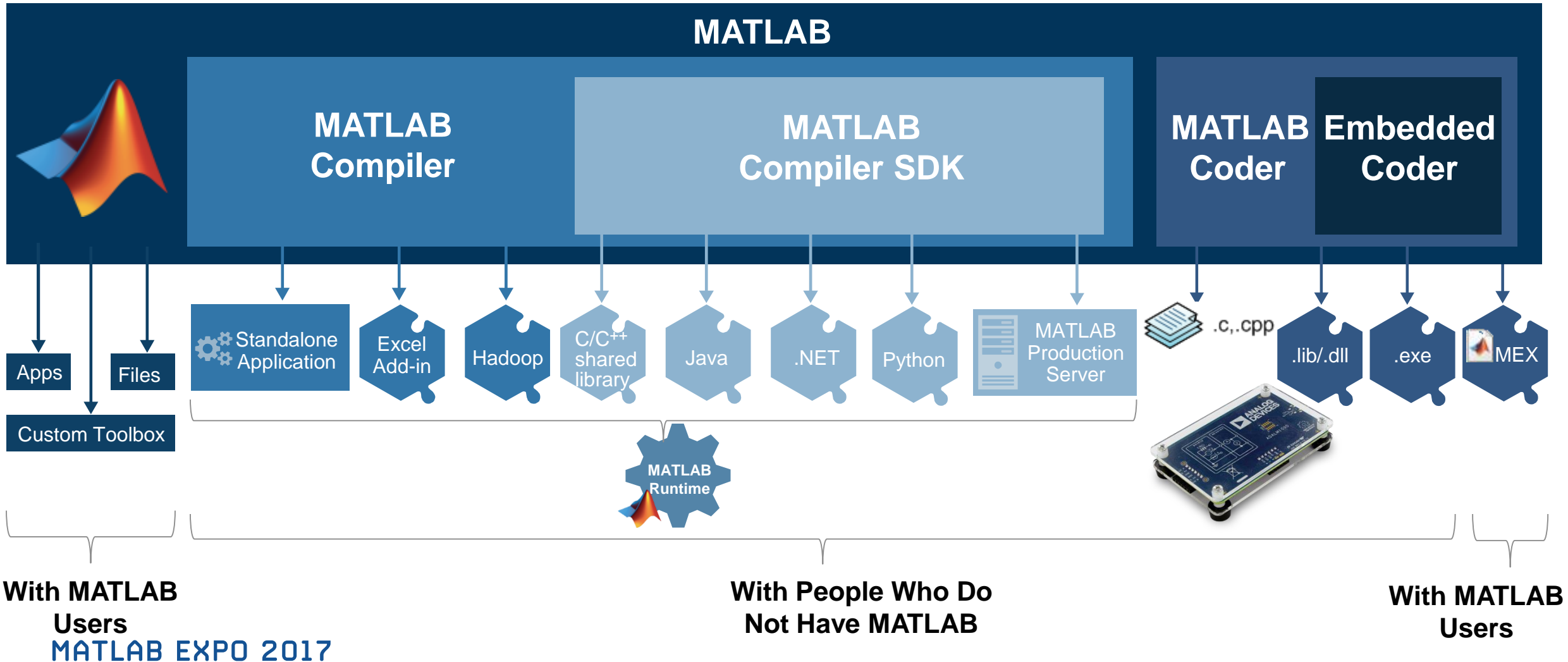
- How to share MATLAB algorithms with multiple internal and external consumers
- Challenging and time consuming to re-code MATLAB algorithms for integration into IT frameworks
- Difficult to migrate solutions to enterprise scale web or cloud frameworks
- How to deliver fast results with large volumes of data

Key Takeaways

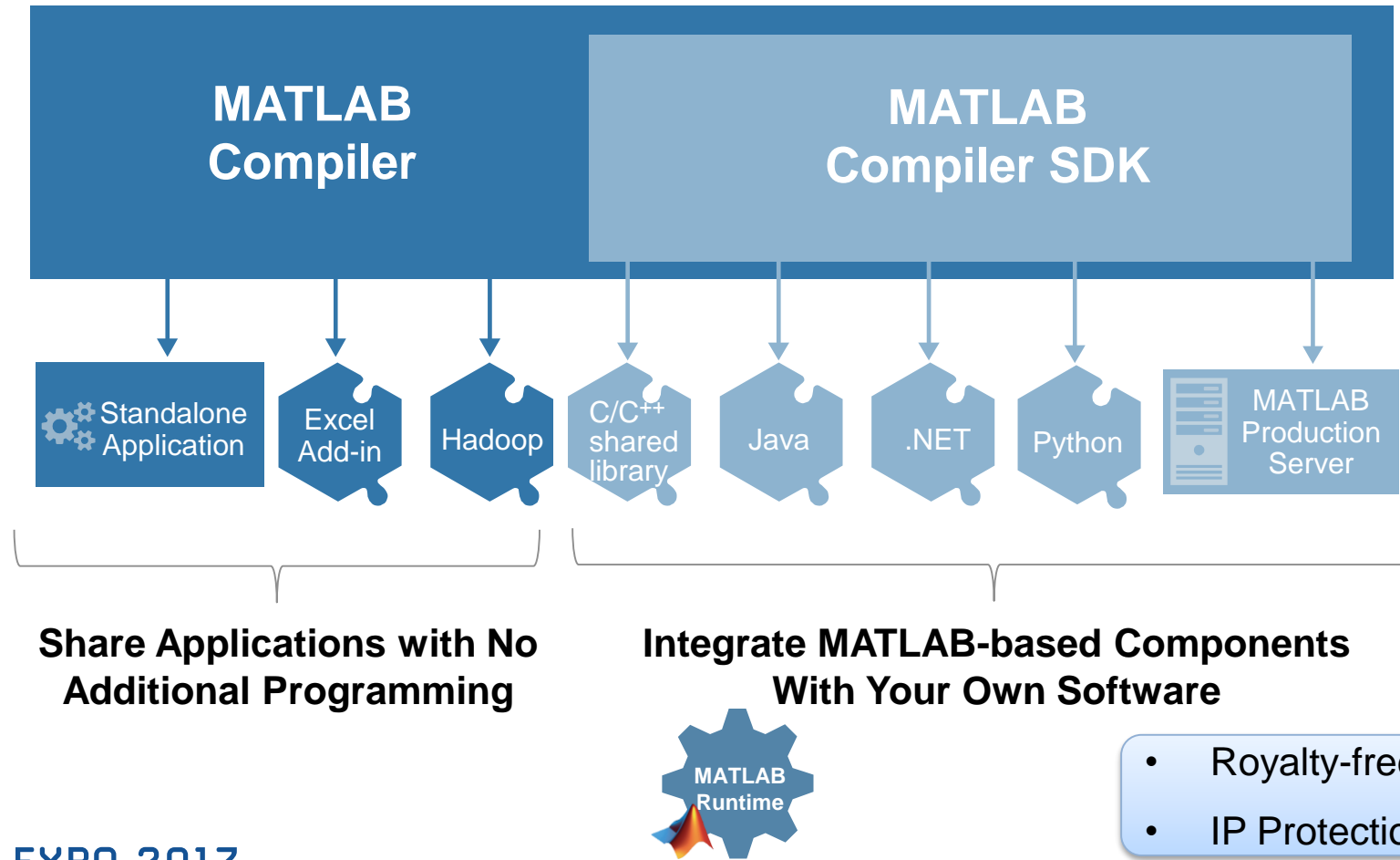
1. Distribute applications to non-MATLAB users royalty-free.
2. Integrate MATLAB functions into existing workflows and development platforms.
3. Deploy MATLAB Analytics for Big Data on Spark-enabled Hadoop clusters.
4. Build a scalable and reliable platform for sharing MATLAB applications.

Sharing and Deploying MATLAB Applications

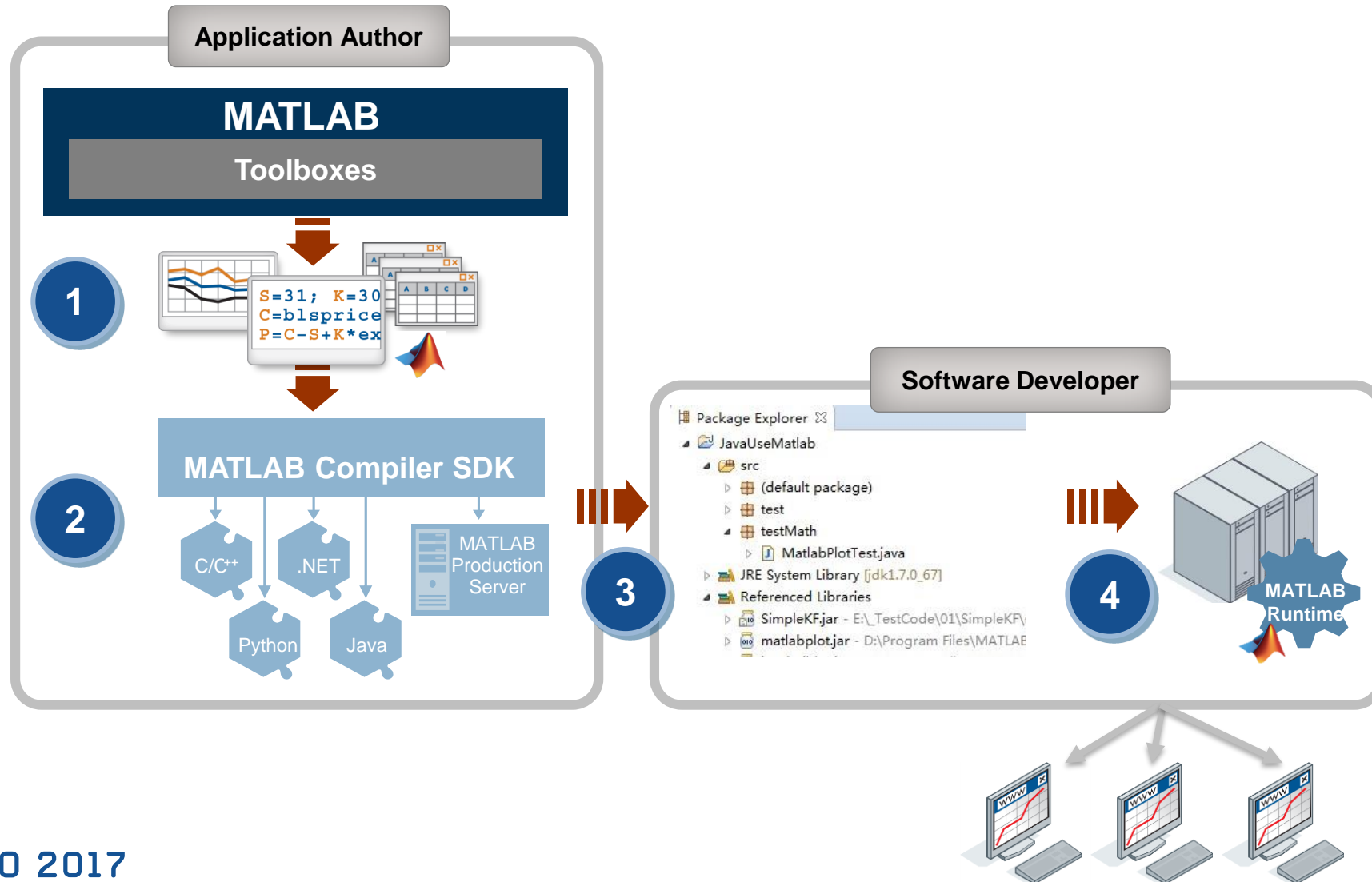
Write Your Programs Once Then Share to Different Targets



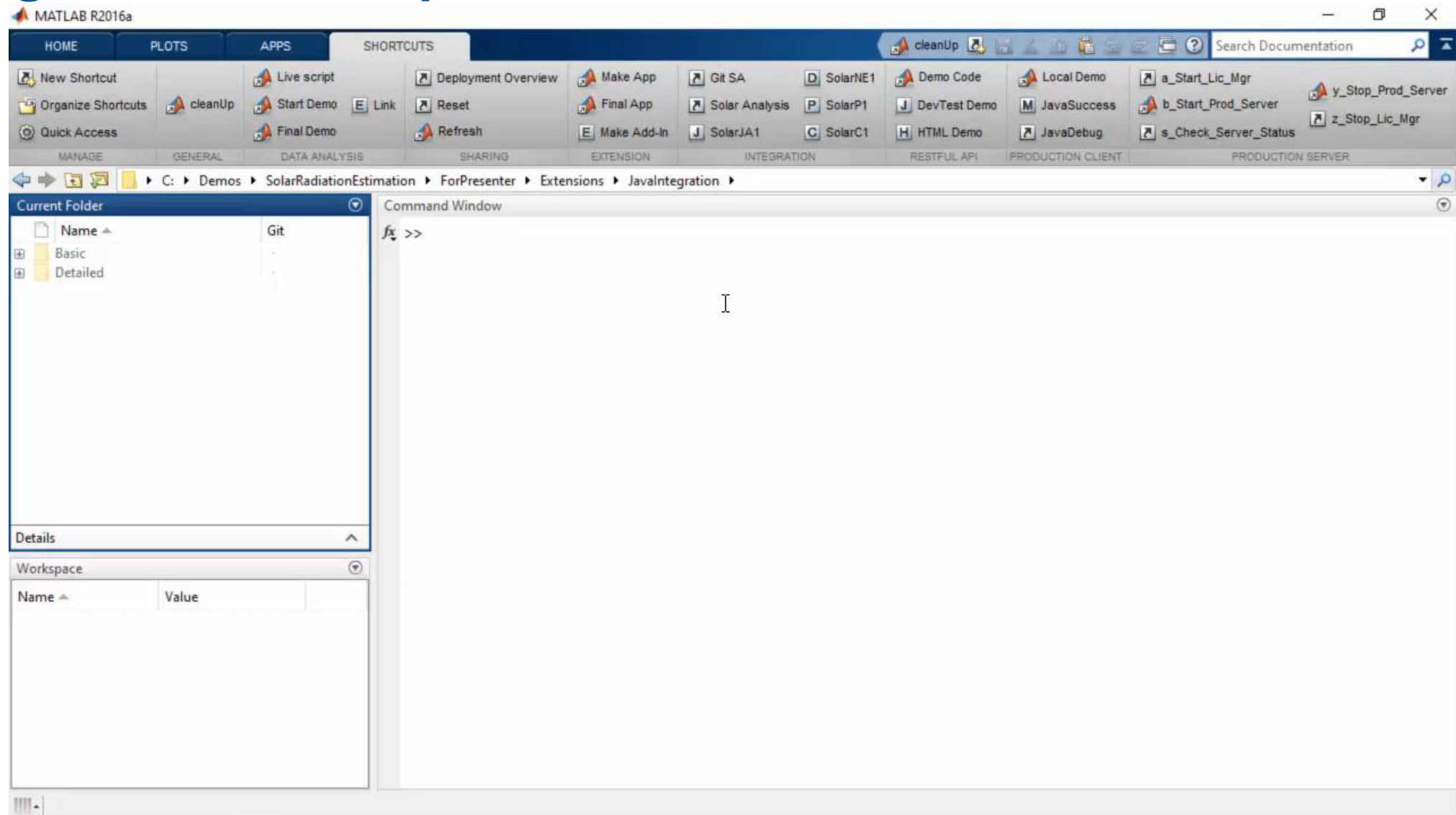
Share with People Who Do Not Have MATLAB



Integrate MATLAB-based Components With Your Own Software



Using MATLAB Compiler SDK to create Java Classes

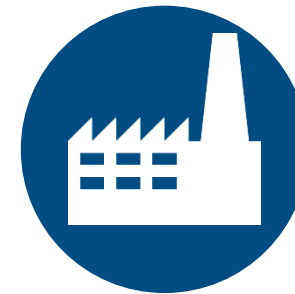


MATLAB *and* MATLAB Production Server

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



Idea



Production

Why MATLAB Production Server Matters to You



Domain
Expert

- ✓ No need to learn another programming language
- ✓ Reliably service large numbers of concurrent requests with low latency
- ✓ Platform independency (win, mac, linux)



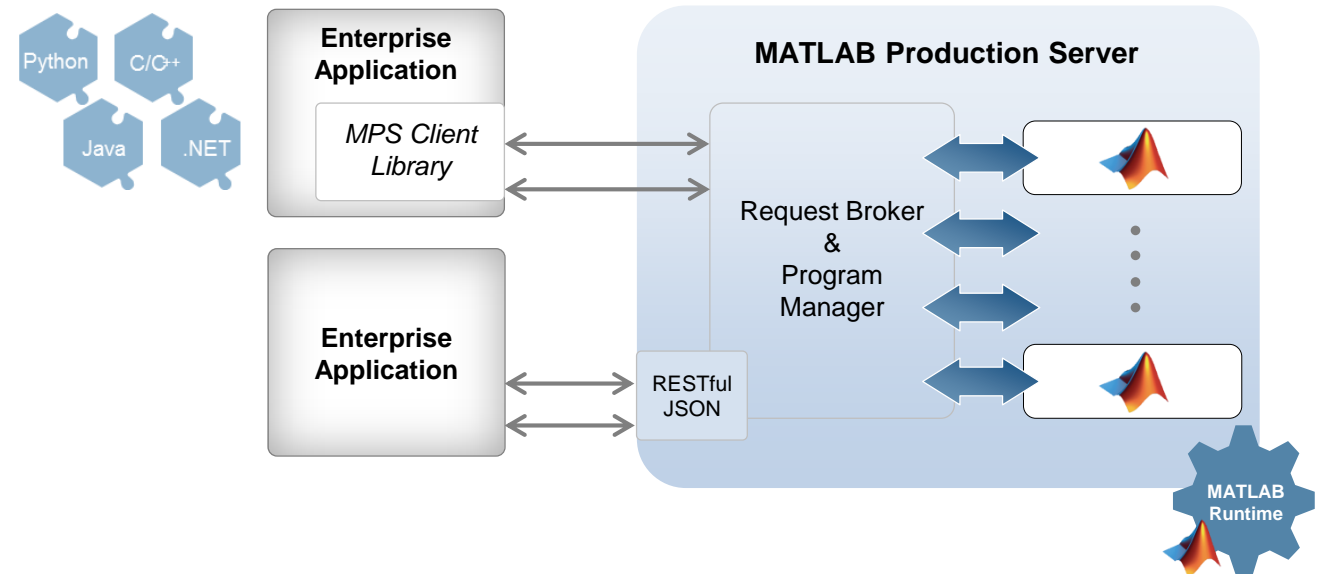
Solution
Architect

- ✓ Web and cloud friendly architecture
- ✓ Client connections can be protected with SSL encryption
- ✓ Automatically deploy updates without server restart

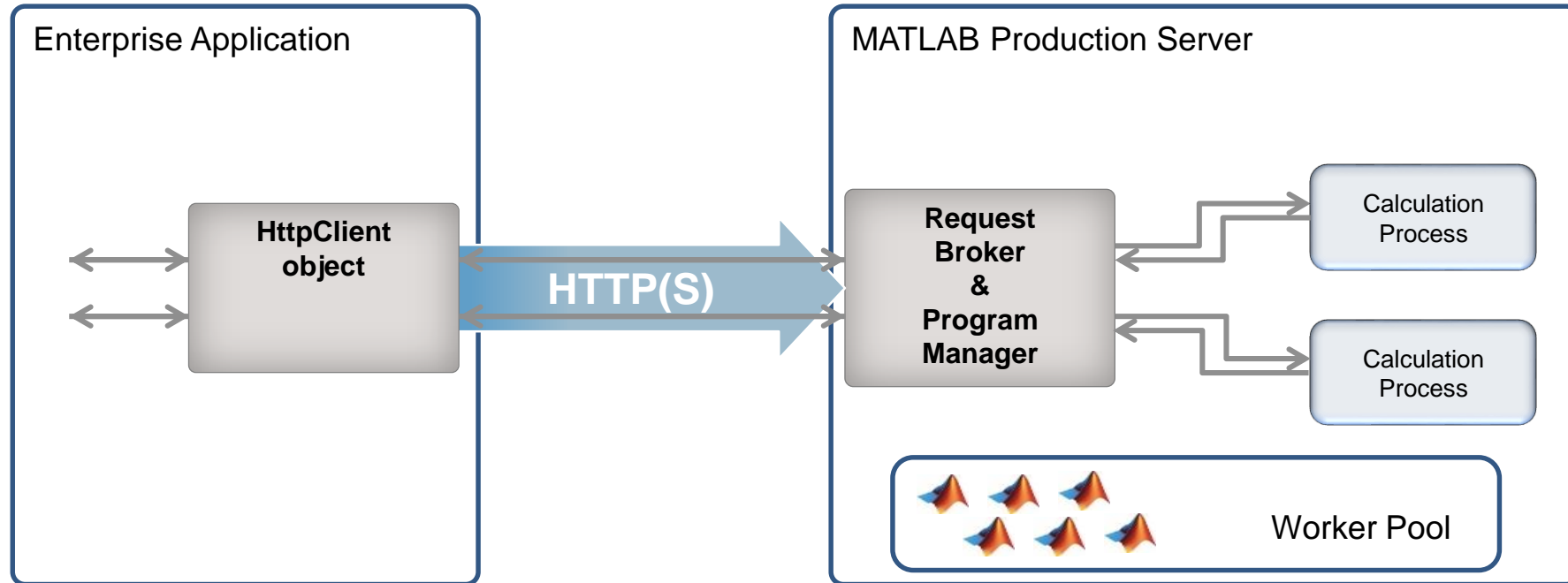
MATLAB Production Server

Enterprise Class Framework For Running Packaged MATLAB Programs

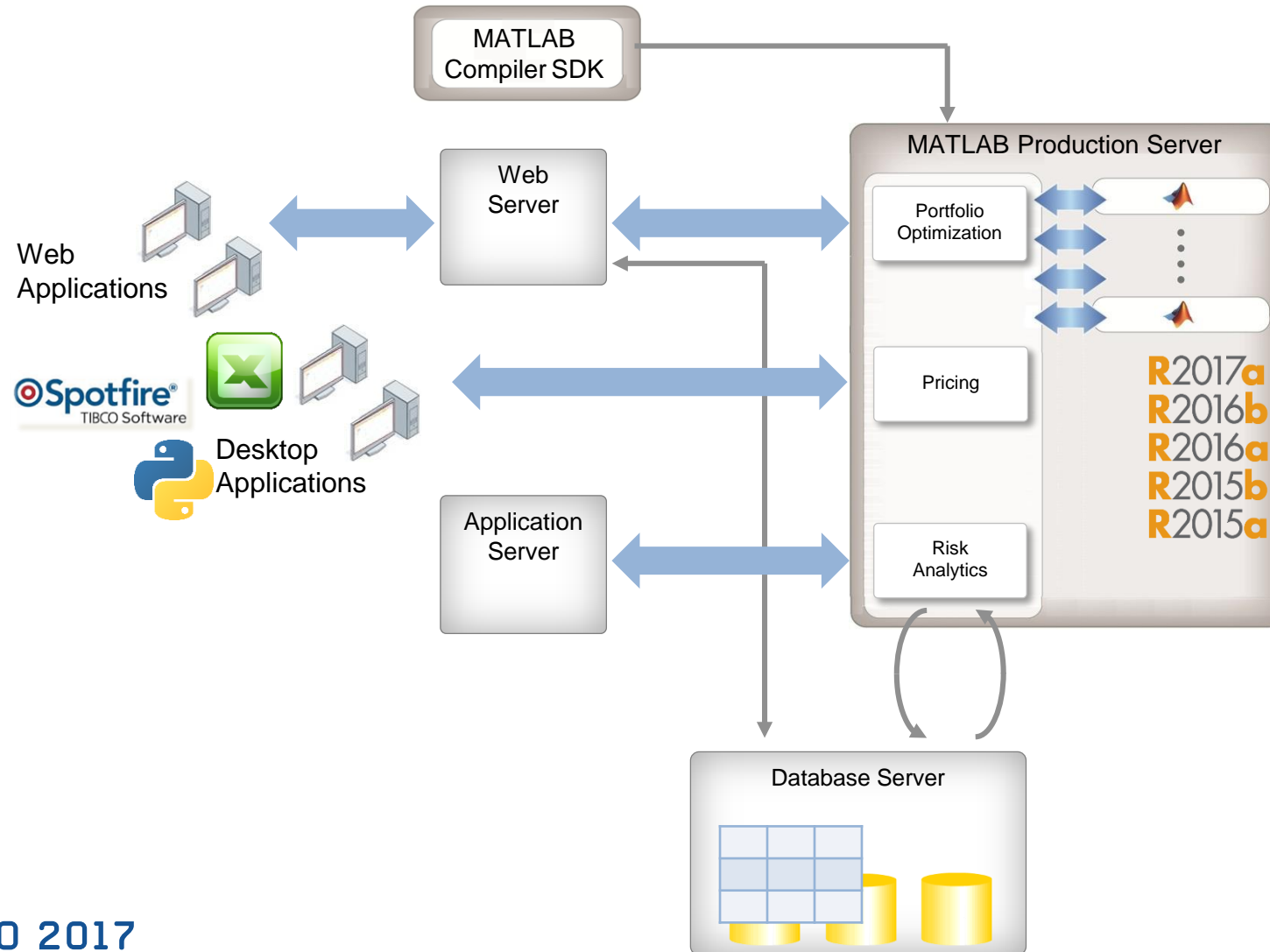
- Server software
 - Manages packaged MATLAB programs and worker pool
- MATLAB Runtime libraries
 - Single server can use runtimes from different releases
- RESTful JSON interface and lightweight client library (C/C++, .NET, Python, and Java)



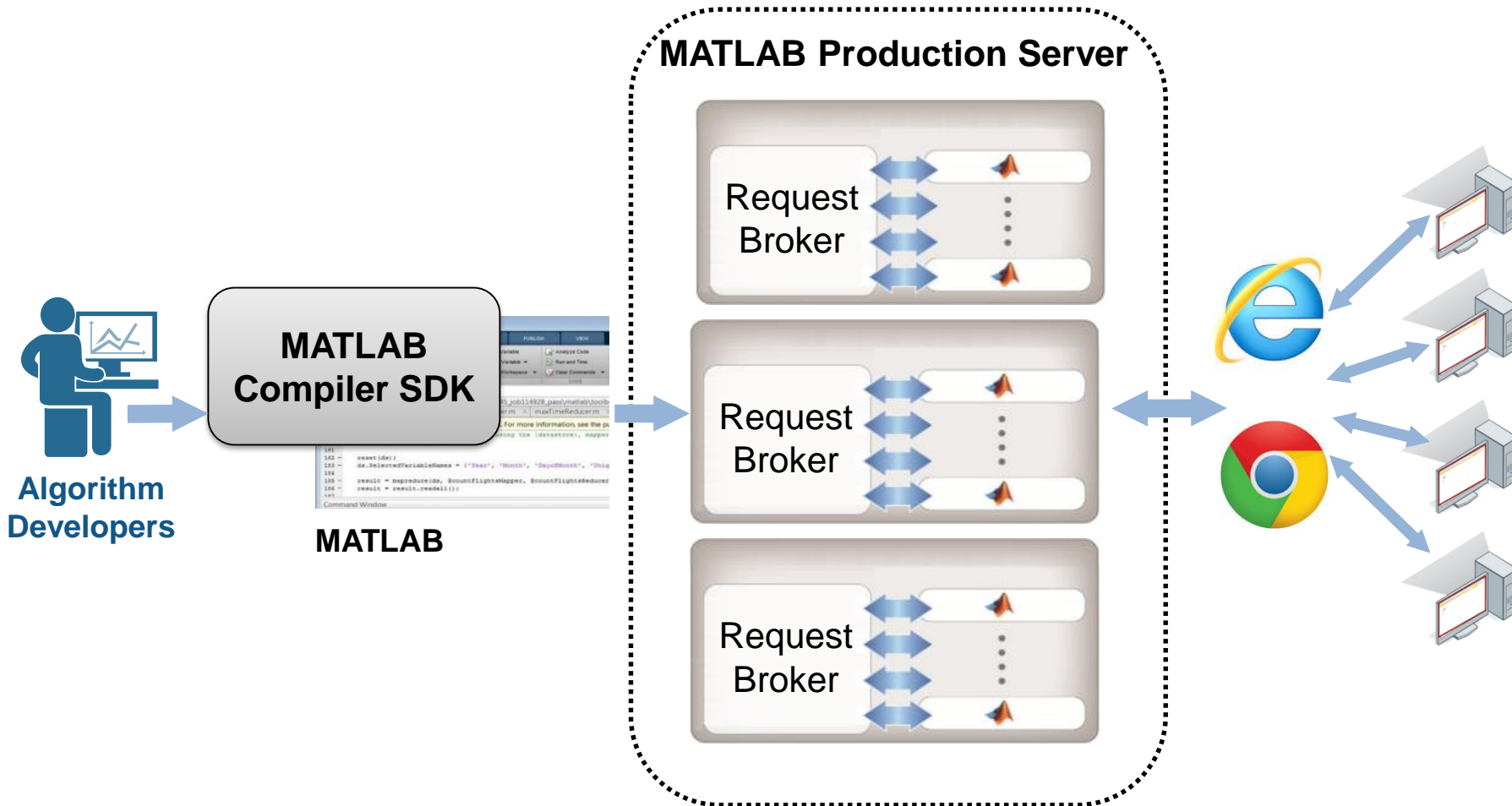
Calling Functions



Example - Integrating with IT systems



Customer examples: Financial customer advisory service



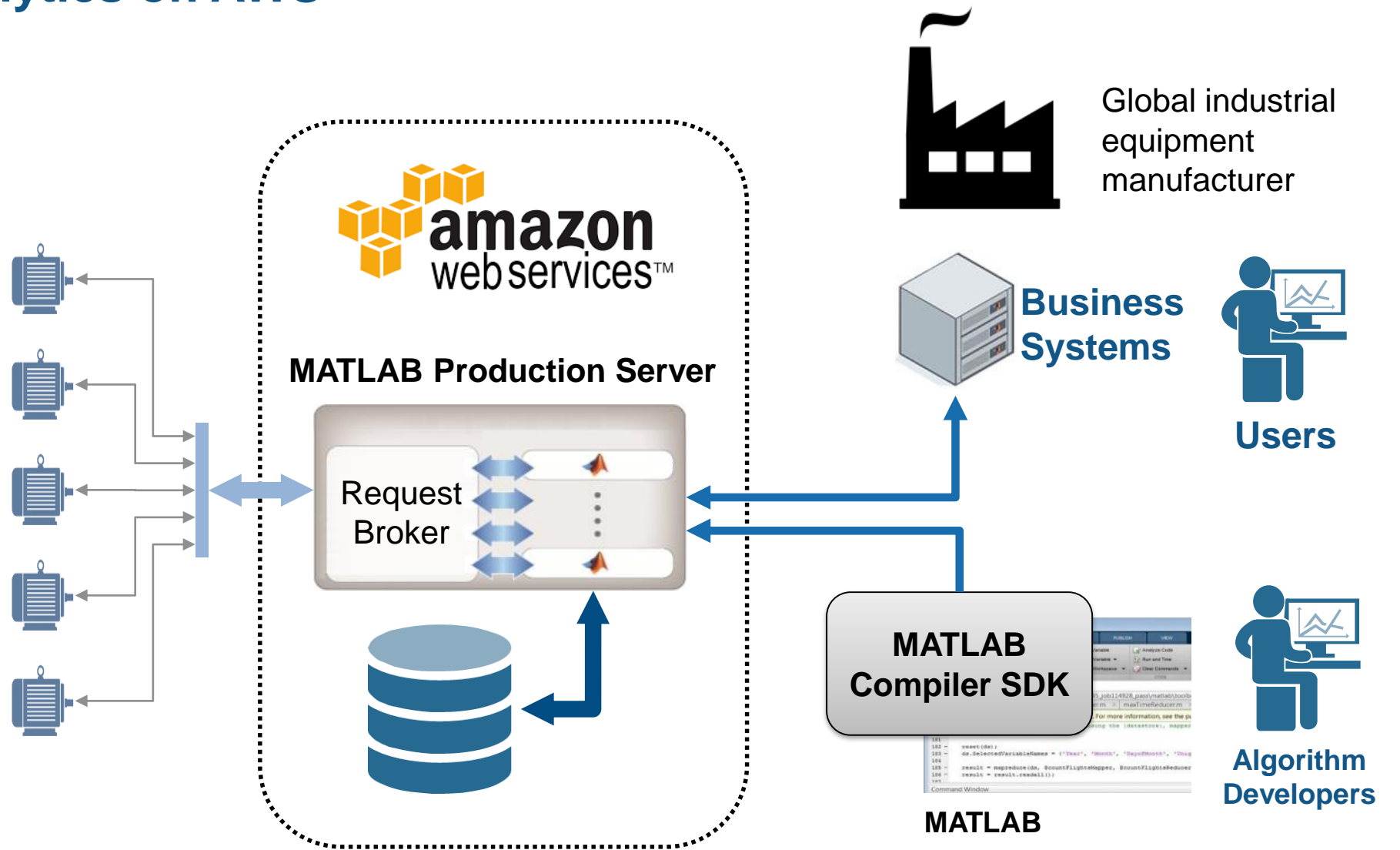
Global financial institution with European HQ

- Saved **€ 2 million annually** for an external system
- Quicker implementation of adjustments in source code by the quantitative analysts
- Knowledge + MATLAB = Build your own systems

Industrial IoT Analytics on AWS

Industrial Equipment

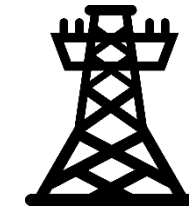
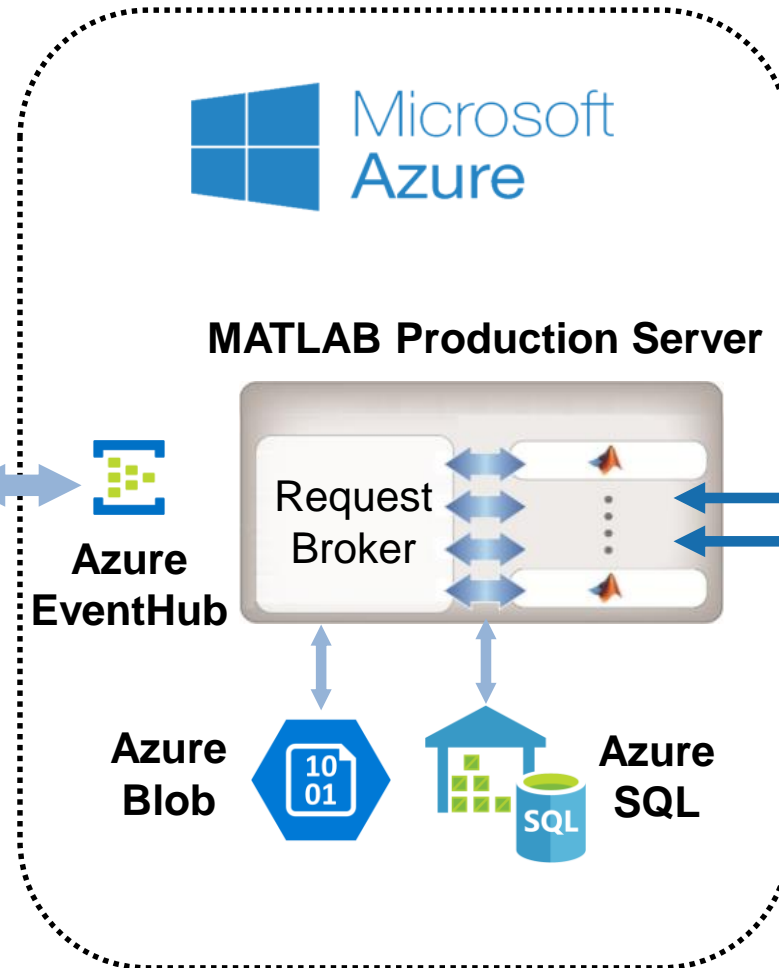
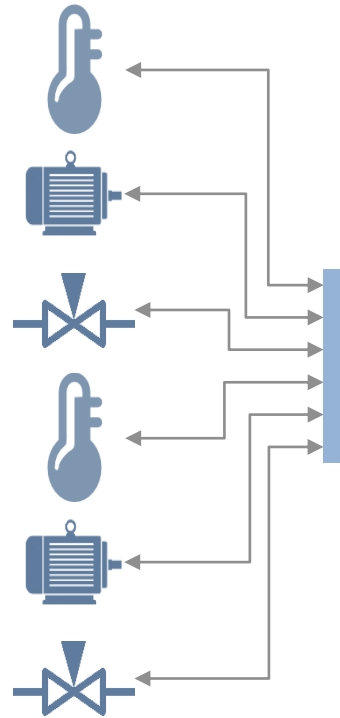
- Networked communication
- Embedded sensors
- Data reduction



Building Automation IoT Analytics on Azure

Building/HVAC automation control system

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



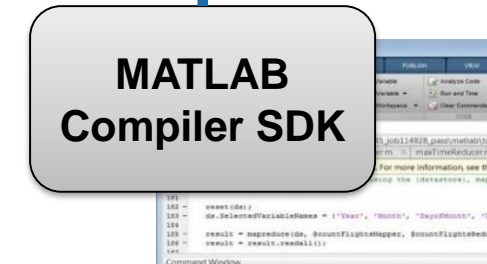
Global heavy duty electrical equipment manufacturer



Business Systems



Users



Algorithm Developers

MATLAB Compiler SDK

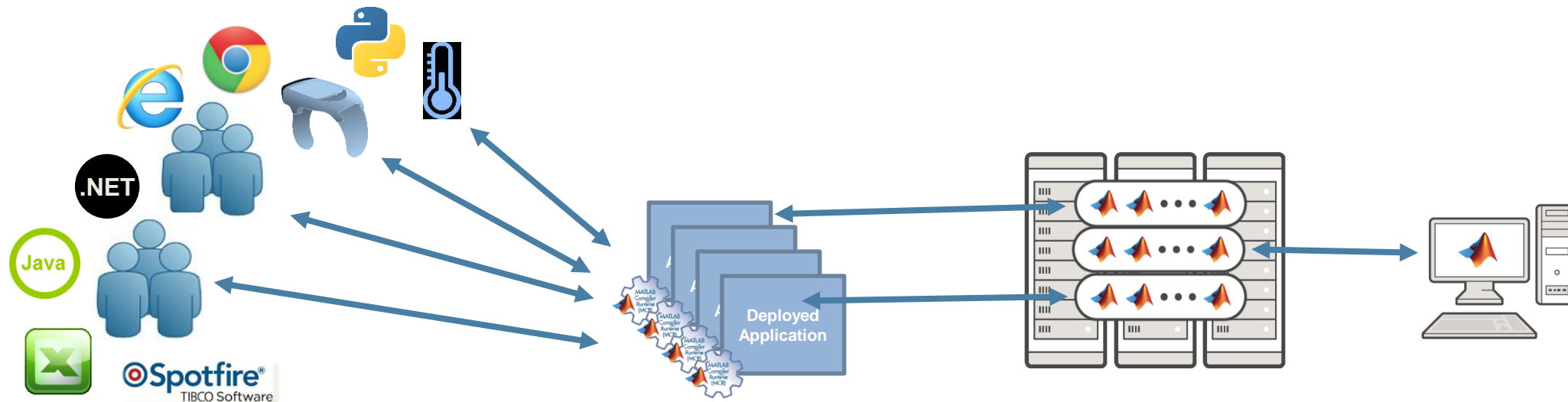
MATLAB

Front-end scalability

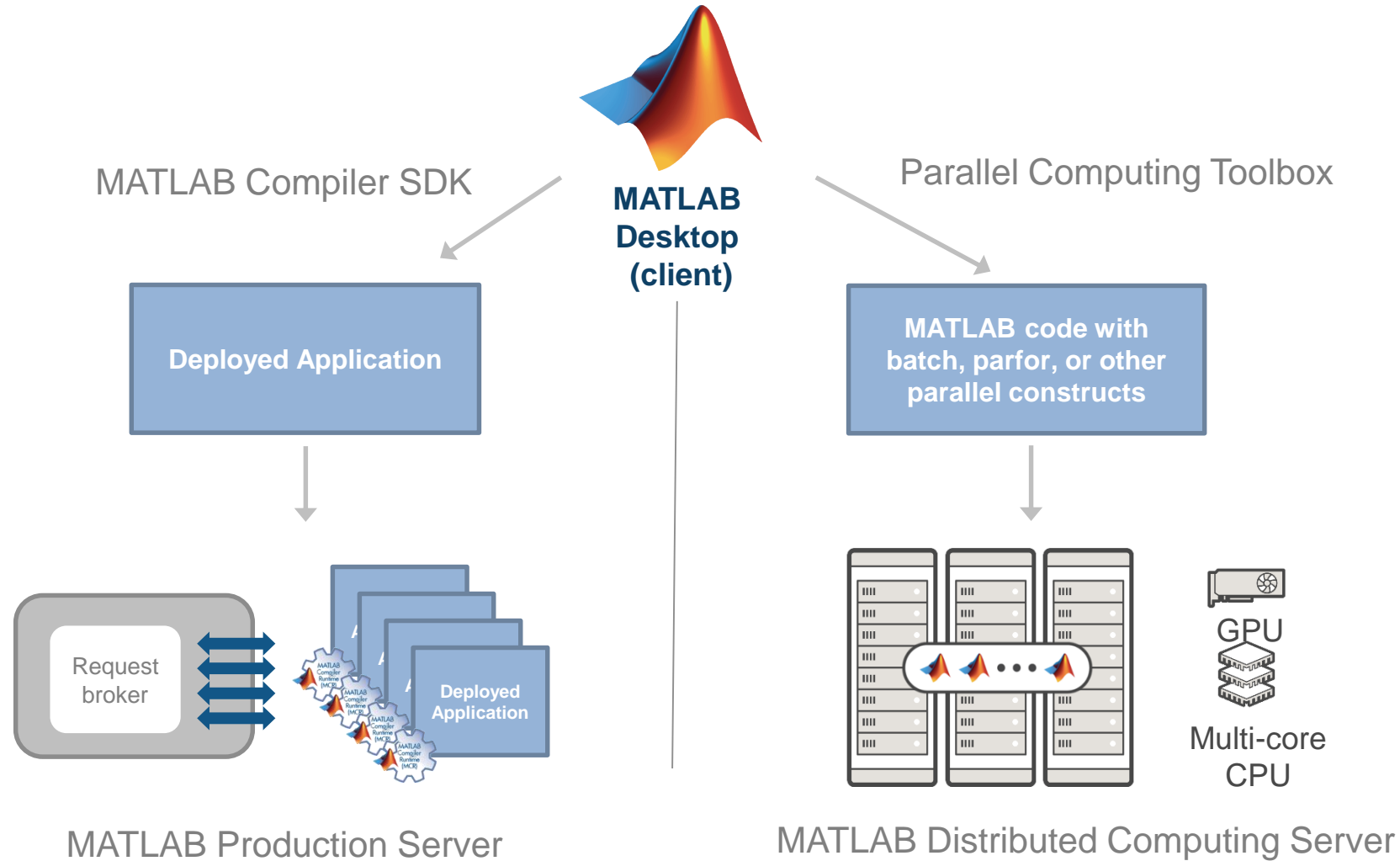
- MATLAB Production Server
 - Application server for MATLAB
- Manage large numbers of requests to run short-running deployed MATLAB programs

Back-end scalability

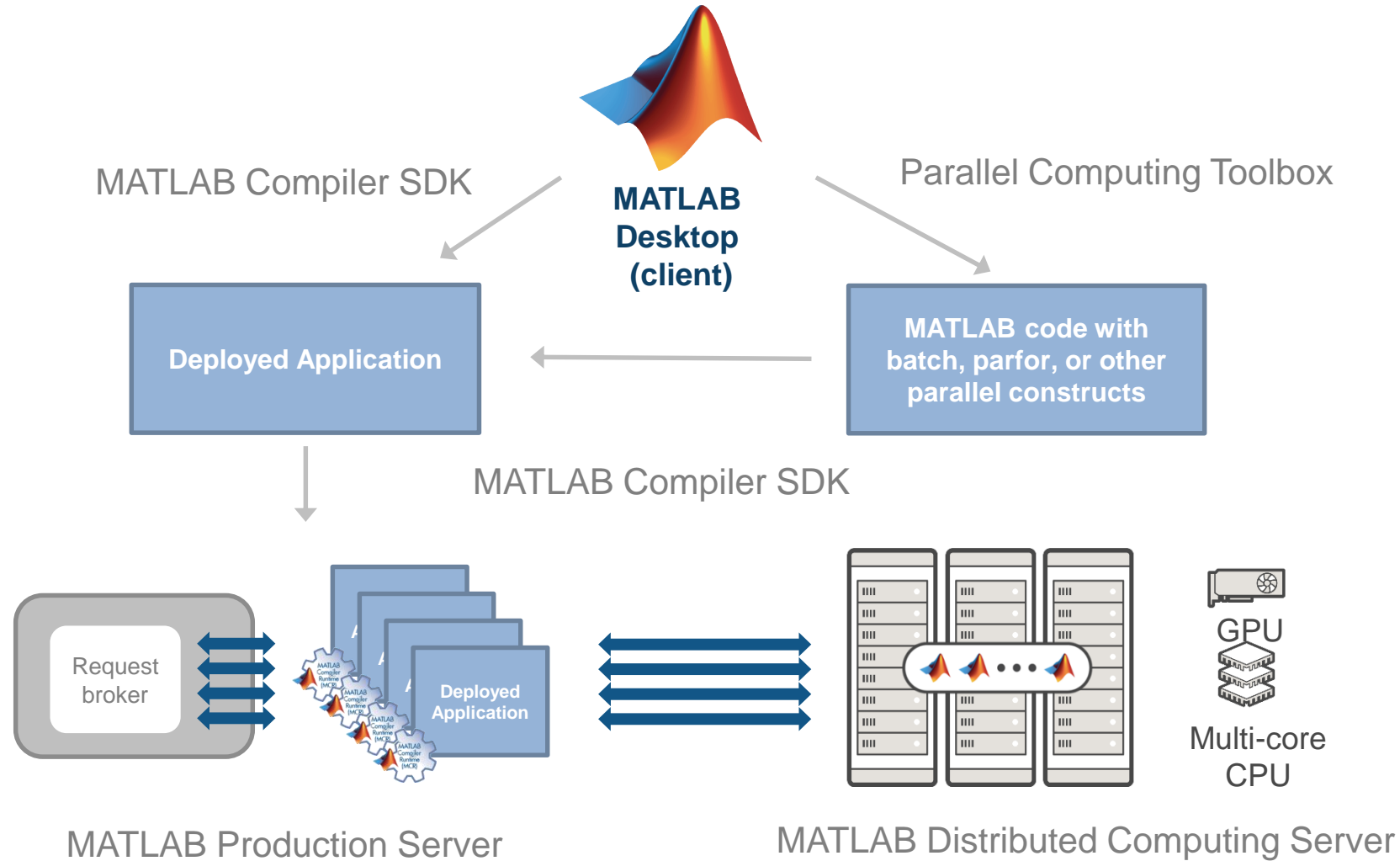
- MATLAB Distributed Computing Server
 - Cluster framework for MATLAB/Simulink
- Speed up computationally intensive programs on computer clusters, clouds, and grids



Distinct Offerings Scale Application Access and Computation



Distinct Offerings Scale Application Access and Computation



MATLAB and MATLAB Distributed Computing Server allow you to

speedup your computations on multiple CPUs and GPUs
overcome memory limitations and
offload computations to **clusters and clouds**.



Desktop



Clusters and Clouds

MATLAB Distributed Computing Server Benefits



Domain Expert

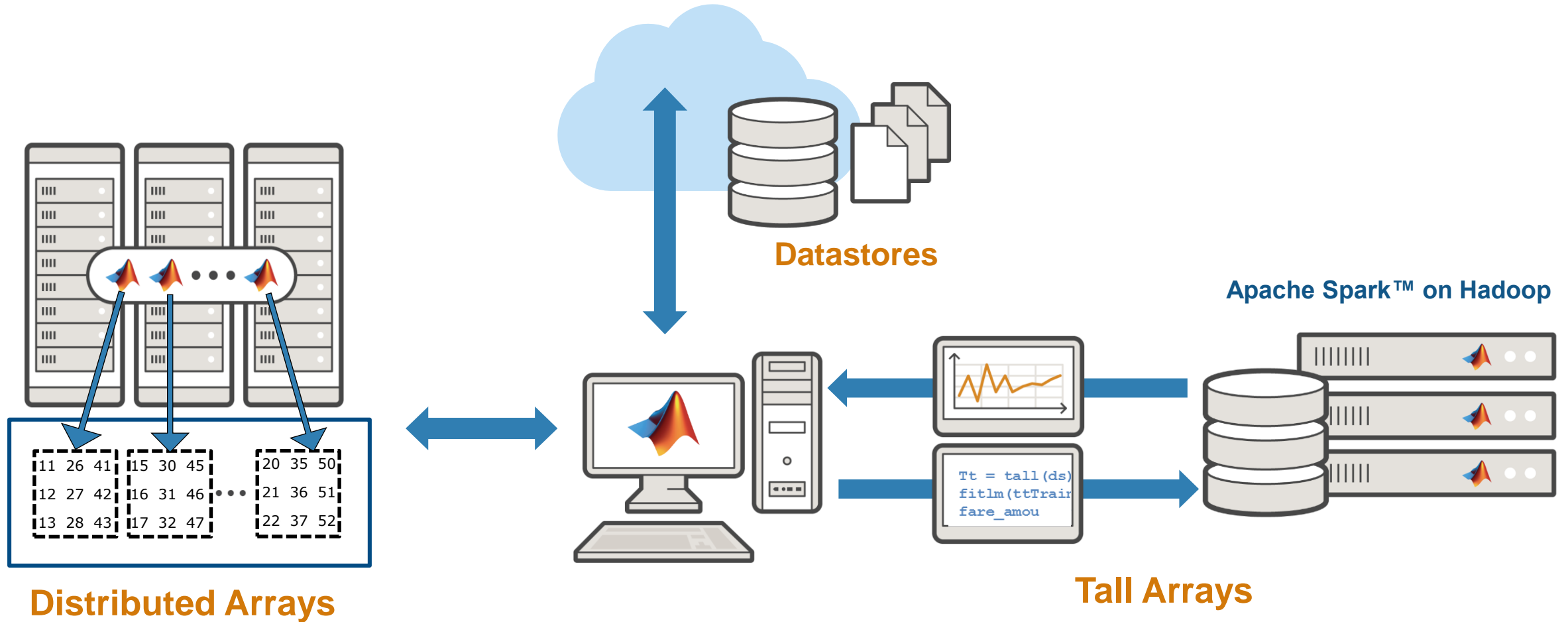
- ✓ Transparently get access to more workers on a cluster.
- ✓ Get access to advanced parallel workflows directly through their MATLAB desktop.
- ✓ Platform independency (win, mac, linux)



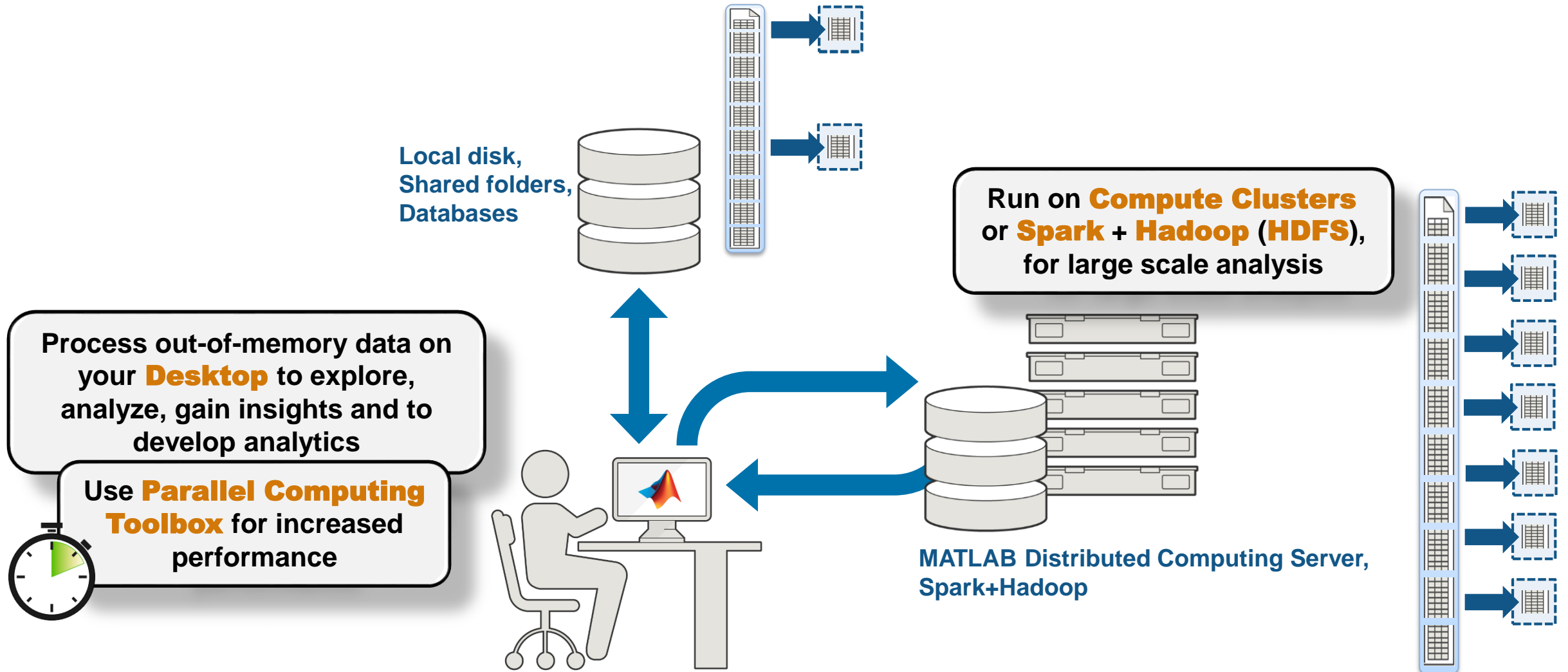
Solution Architect

- ✓ Don't need to build a framework for submission and retrieval.
- ✓ Can easily scale up with more workers
- ✓ Client connections can be protected with SSL encryption

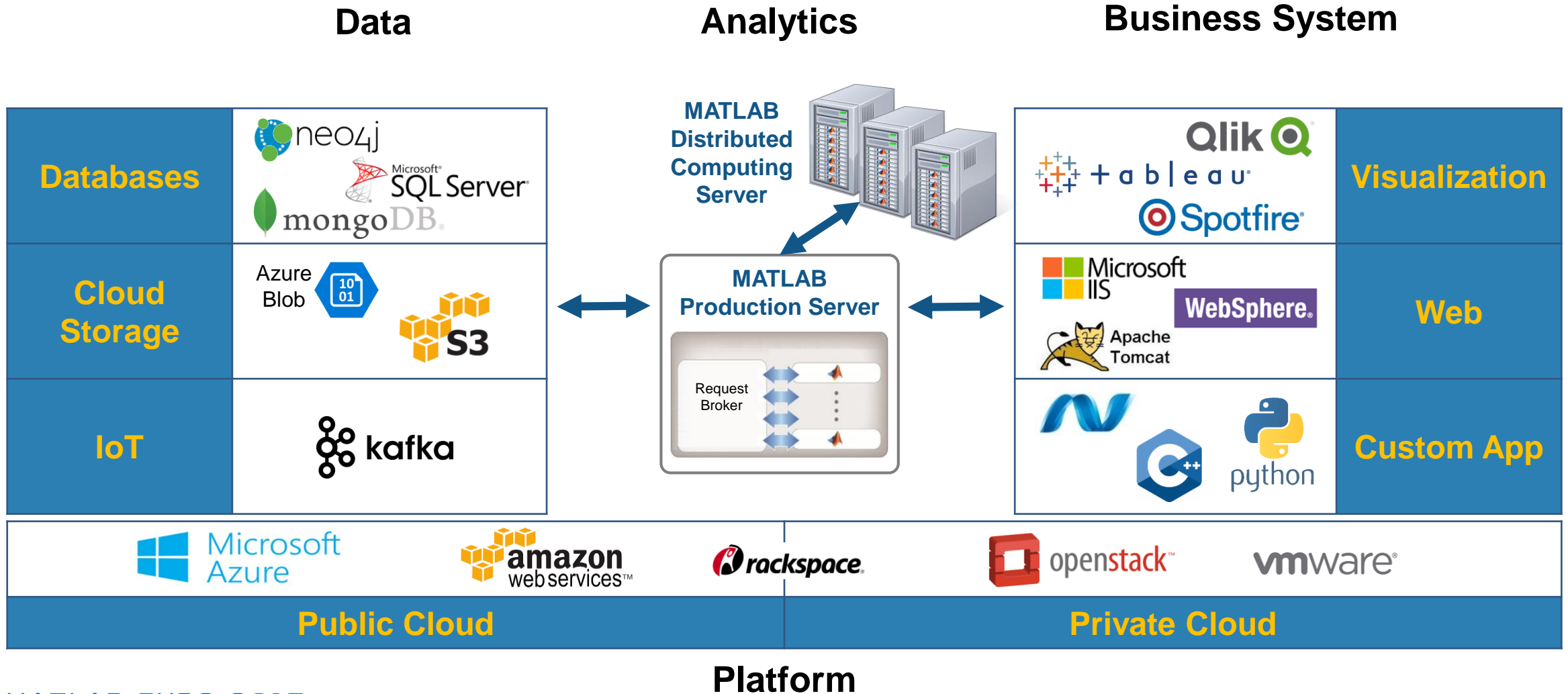
Data Intensive: Big Data support in MATLAB



Summary for tall arrays



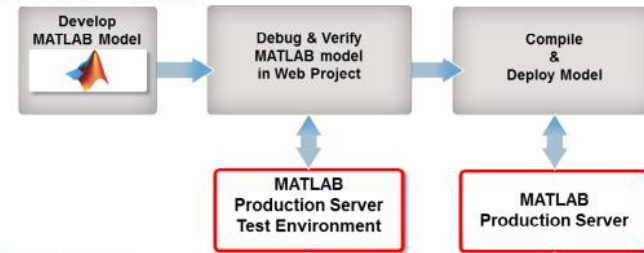
Technology Stack



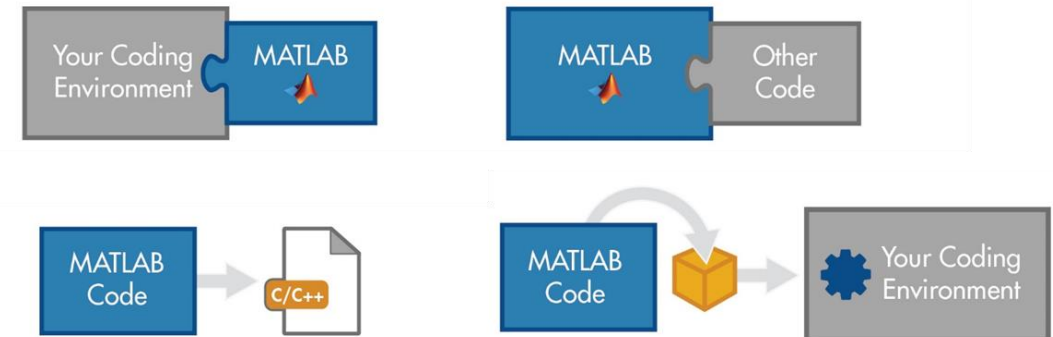
Online Resources

- 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](#)

MATLAB developer:



Web developer:



MathWorks Consulting Services can help you!

We can support you during the 3 different phases of the application development process

