



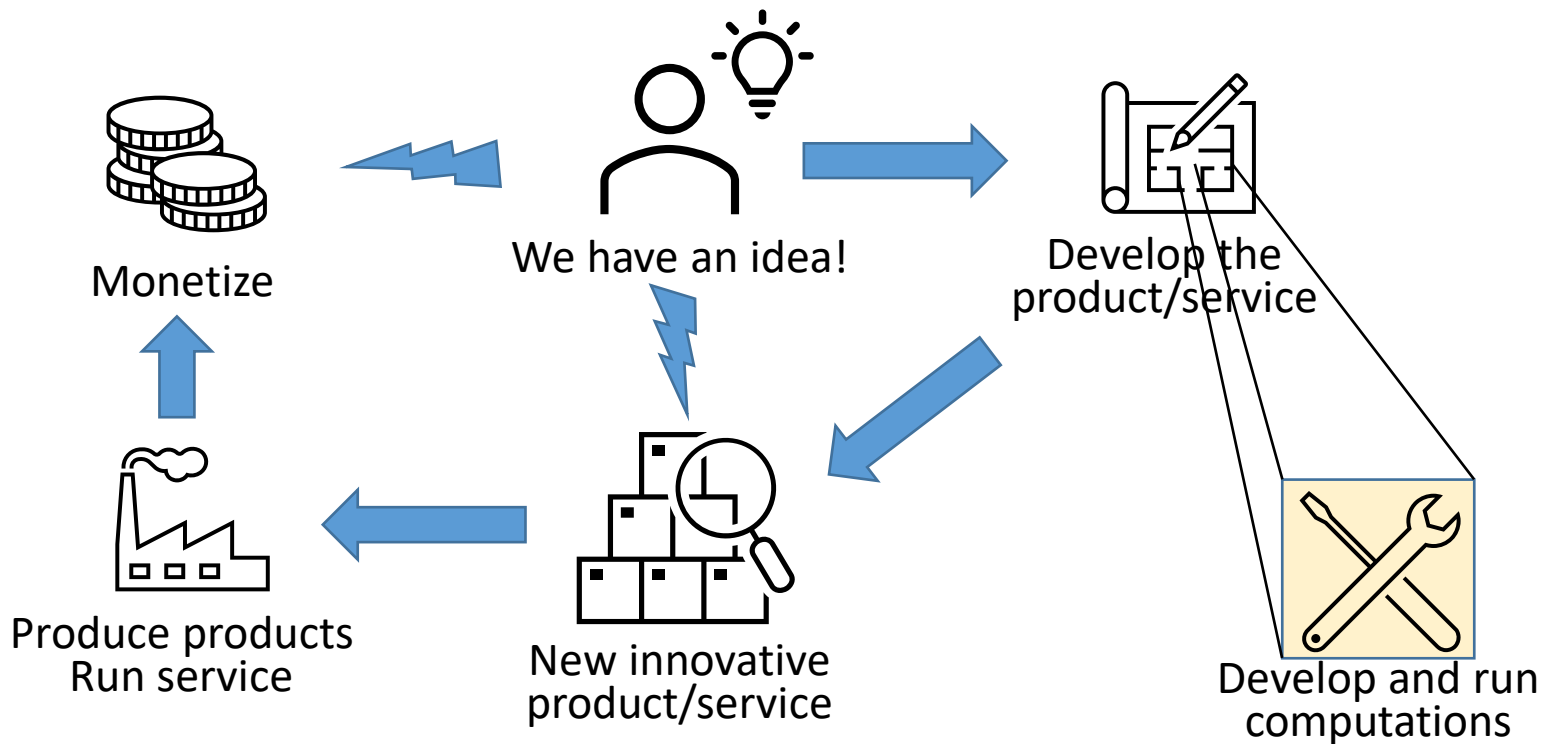
**Warsaw University
of Technology**

BalticLSC Platform

Low-Code Large-Scale Computations

Michał Śmiałek, Warsaw University of Technology

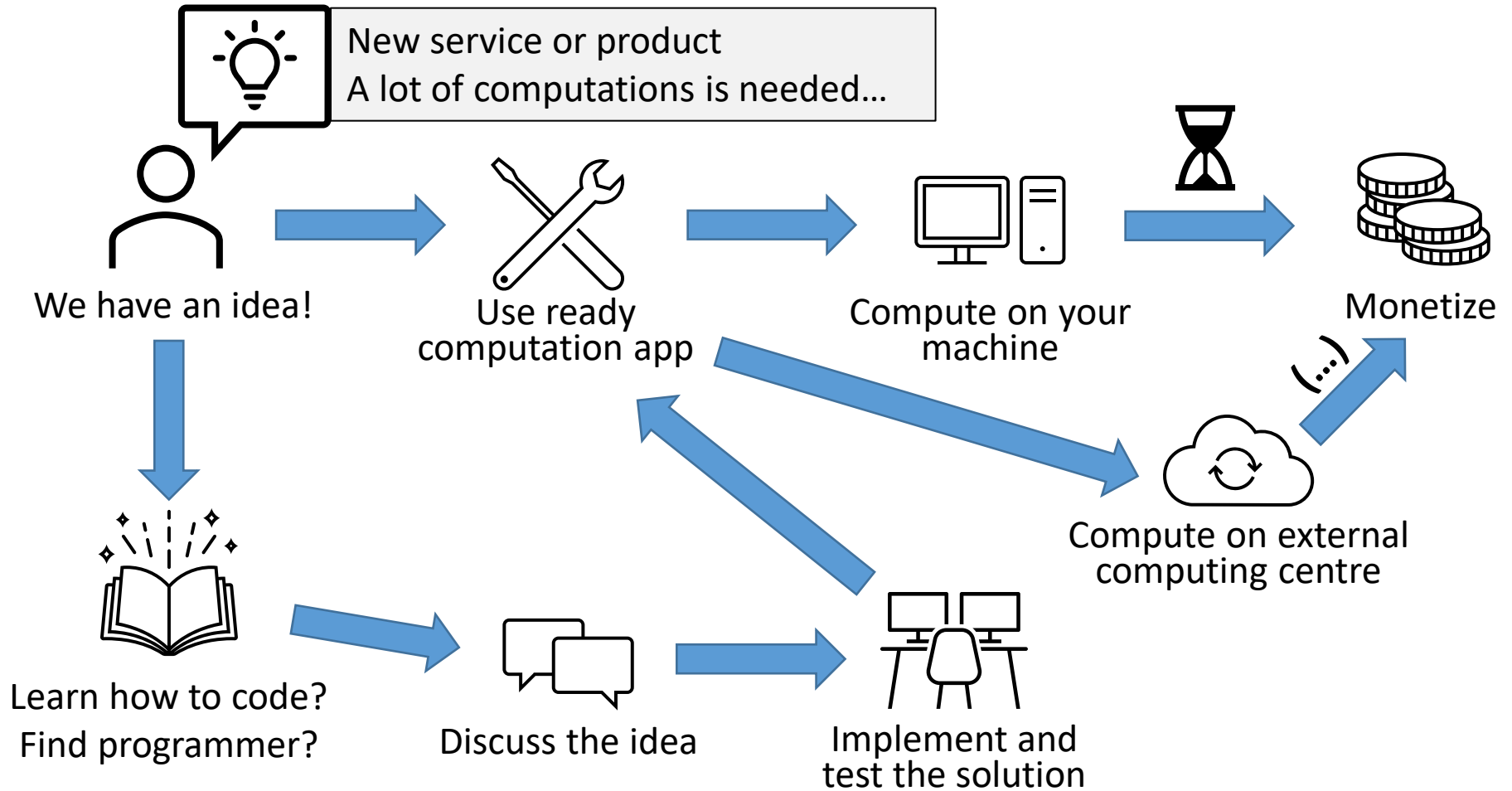
Turning great ideas into ready solutions



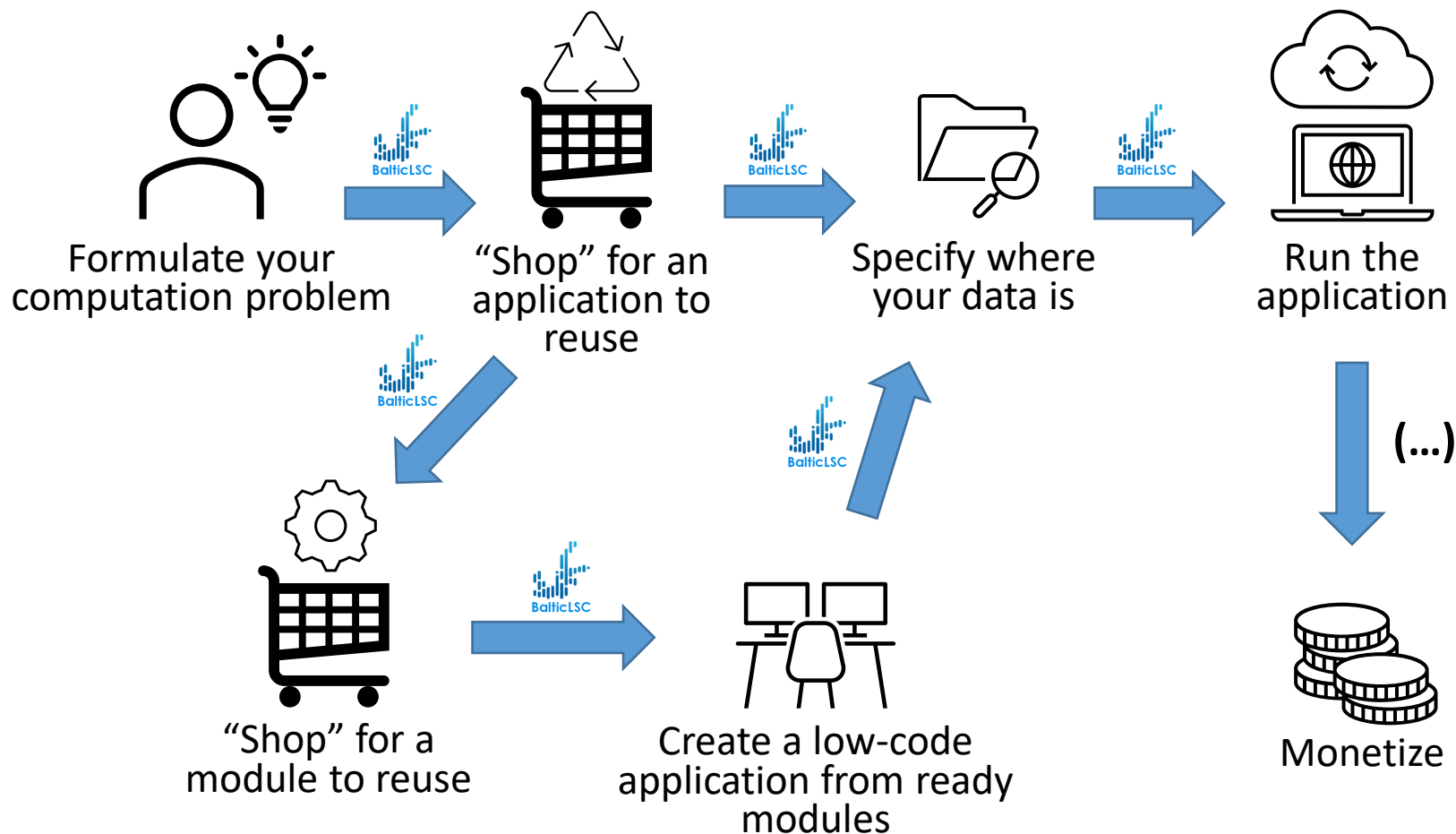
P: New Catamaran Yacht
P: New Virus Vaccine
S: New Airport Security System
S: New Weather Forecasting Service

Calculate yacht's hull aerodynamics...
Compute DNA sequences of a virus...
Train a neural network (AI system)...
Test weather forecast algorithms...

How to develop an innovation?




From idea to ready solution with BalticLSC



Components of the BalticLSC Platform



Application Store



App store

Computation cockpit


Data shelf

Development shelf

Help for the Demo

BalticLSC


logged in as "demo"
version 12/Mar/2021



YetAnotherImageProcessor

Updated on December 4th 2019, 12:00
Yet Another Image Processor


Add to Cockpit



My Reworked Film Processor

Updated on April 7th 2020, 03:35
Film processor.


Add to Cockpit



Dev Spectral Analysis App

Updated on December 4th 2019, 12:00
Spectral analyser app.


Add to Cockpit



FaceRecognizer

Updated on December 4th 2019, 12:00
Recognizes faces in the crowd


In Cockpit



Hull Optimizer

Updated on December 4th 2019, 12:00
Optimizes ship hulls.


Add to Cockpit



WildlifeRecognizer

Updated on December 4th 2019, 12:00
Recognizes animals


Add to Cockpit



Simple Image Processor

Updated on December 4th 2019, 12:00
Edges out photos.


Add to Cockpit



Covid-2 Analyzer

Updated on December 4th 2019, 12:00
Analysis of Covid-2


Add to Cockpit



Greying Image Processor

Updated on July 17th 2020, 12:00
Greys color images.

Add to Cockpit




Edging Image Processor

Updated on July 17th 2020, 12:00
Edges color images.

In Cockpit

Computation Cockpit



App store

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Help for the Demo

BalticLSC

logged in as "demo"
version 12/Mar/2021


FaceRecognizer

Name	Version	Actions	Start time	End time	Consumed credits	Reserved credits	Status	Priority	Private	Cluster
TestTask	0.1		2021-04-07 20:57:10	2021-04-09 16:00:45	0	100	Completed	1	No	

Edging Image Processor

Name	Version	Actions	Start time	End time	Consumed credits	Reserved credits	Status	Priority	Private	Cluster allocation	Arch
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Data Shelf



BalticLSC

logged in as "demo"
version 12/Mar/2021

App store

Computation cockpit

Data shelf


Development shelf

Help for the Demo

Data sets

Name	Edit	Multiplicity	Data Type	Data Structure	Access Type	Access values
EdgerDemoInput1	<div>Edit</div> <div>Copy</div>	Multiple	ImageFile		FTP	{ "Host": "balticlsc-gateway.iem.pw." >User": "baltic" }
EdgerDemoOutput1	<div>Edit</div> <div>Copy</div>	Multiple	ImageFile		FTP	{ "Host": "balticlsc-gateway.iem.pw." >User": "baltic" }
EdgerDemoInput2	<div>Edit</div> <div>Copy</div>	Multiple	ImageFile		FTP	{ "Host": "balticlsc-gateway.iem.pw." >User": "baltic" }
EdgerDemoOutput2	<div>Edit</div> <div>Copy</div>	Multiple	ImageFile		FTP	{ "Host": "balticlsc-gateway.iem.pw." >User": "baltic" }

Development Shelf




BalticLSC

logged in as "demo"
version 12/Mar/2021

☐ Show only owned units

Create applicationCreate moduleShow toolbox content


ApplicationsModules



User Decision

Updated Tue Nov 05 2019


User decision on passing data from input to outputs



Neural Network Learner

Updated Sun Mar 15 2020


Trains neural net from training data.



Neural Network Classifier

Updated Sun Feb 09 2020


Classify data set.



Matrix Operations

Updated Sun Mar 15 2020


Operations on a matrix.



Regression Algorithm

Updated Sun Mar 15 2020


Applies regression to data.




Spectral Analysis

Updated Sun Mar 15 2020


Spectral analysis of images.




App store




Computation cockpit



Data shelf




Development shelf



Help for the Demo

CAL Editor

 **BalticLSC**

logged in as "demo"
version 12/Mar/2021

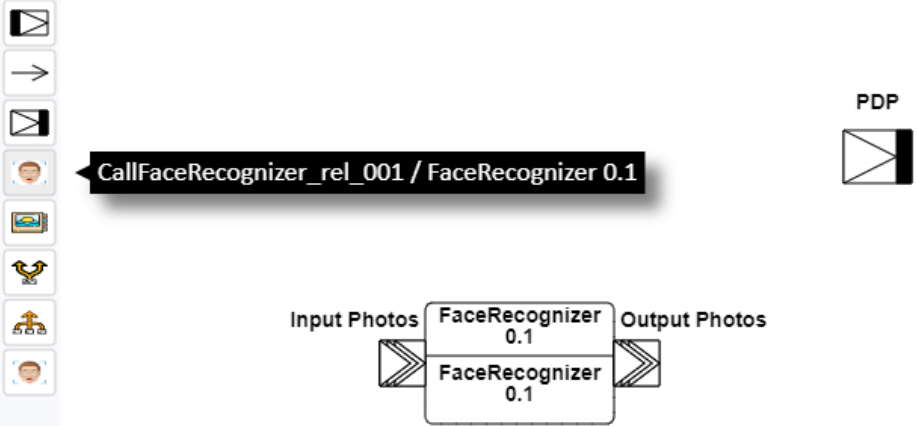
CAL Application (diagram GUID: c2765641-92a3-45db-92ff-a0f357cf363a)

App store
Computation cockpit
Data shelf
Development shelf
Help for the Demo

CallFaceRecognizer_rel_001 / FaceRecognizer 0.1

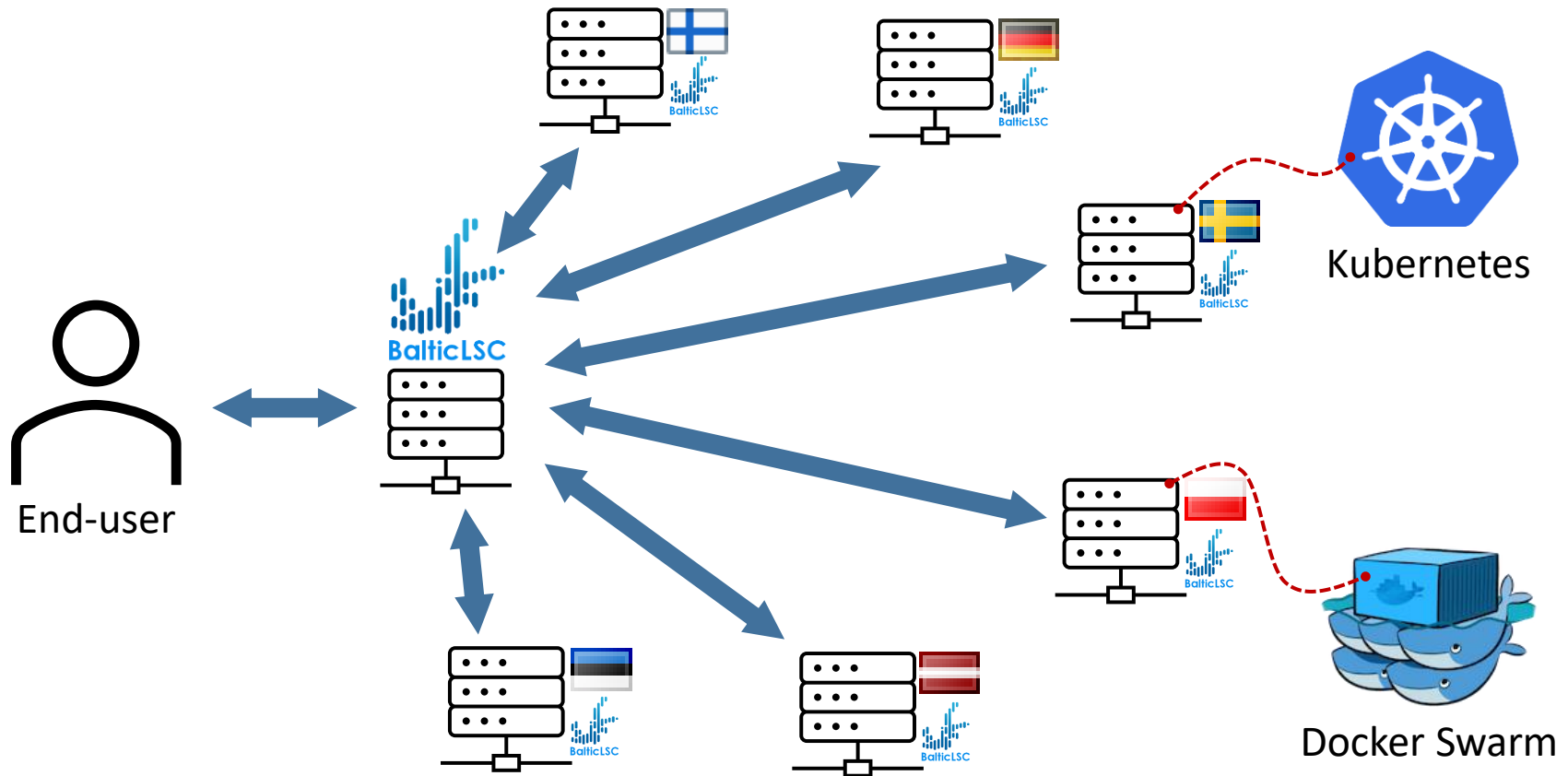
PDP

Input Photos FaceRecognizer 0.1 Output Photos



The diagram illustrates a CAL application for face recognition. It features a central 'FaceRecognizer 0.1' block with two input ports on the left and two output ports on the right. The left input ports are labeled 'Input Photos' and the right output ports are labeled 'Output Photos'. A 'PDP' (Process Data Port) block is positioned to the right of the recognizer. A tooltip points to the 'CallFaceRecognizer_rel_001 / FaceRecognizer 0.1' block. The interface includes a sidebar with navigation options and a top bar with user information and application details.

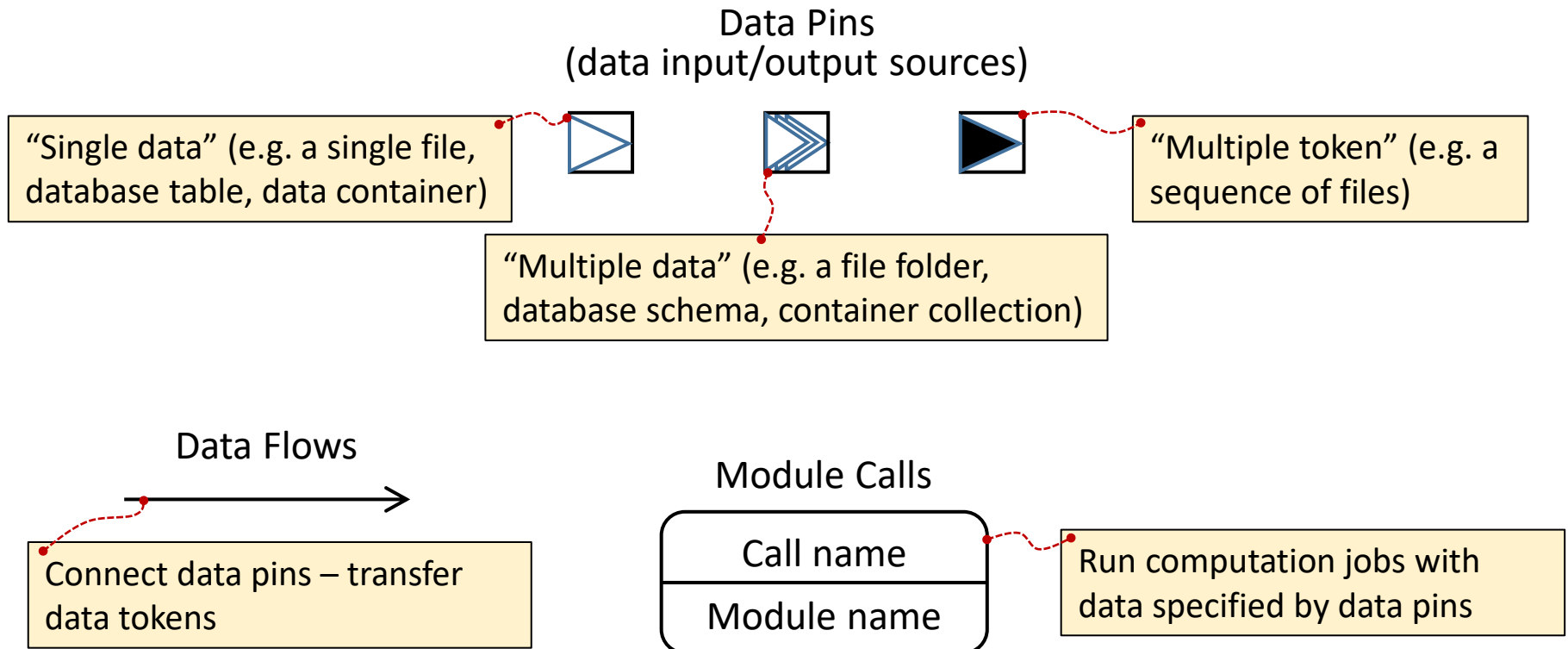
BalticLSC Computation Platform



Computation Clusters of various size and operating software can participate in the BalticLSC Computation Platform

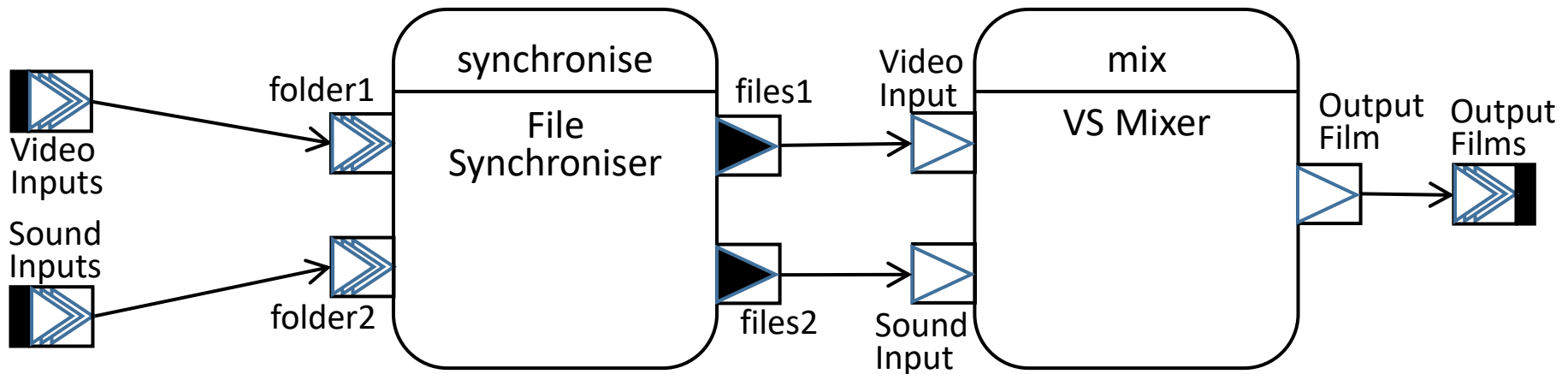
BalticLSC Applications

- Computation Application Language - a visual (graphical) low-code language



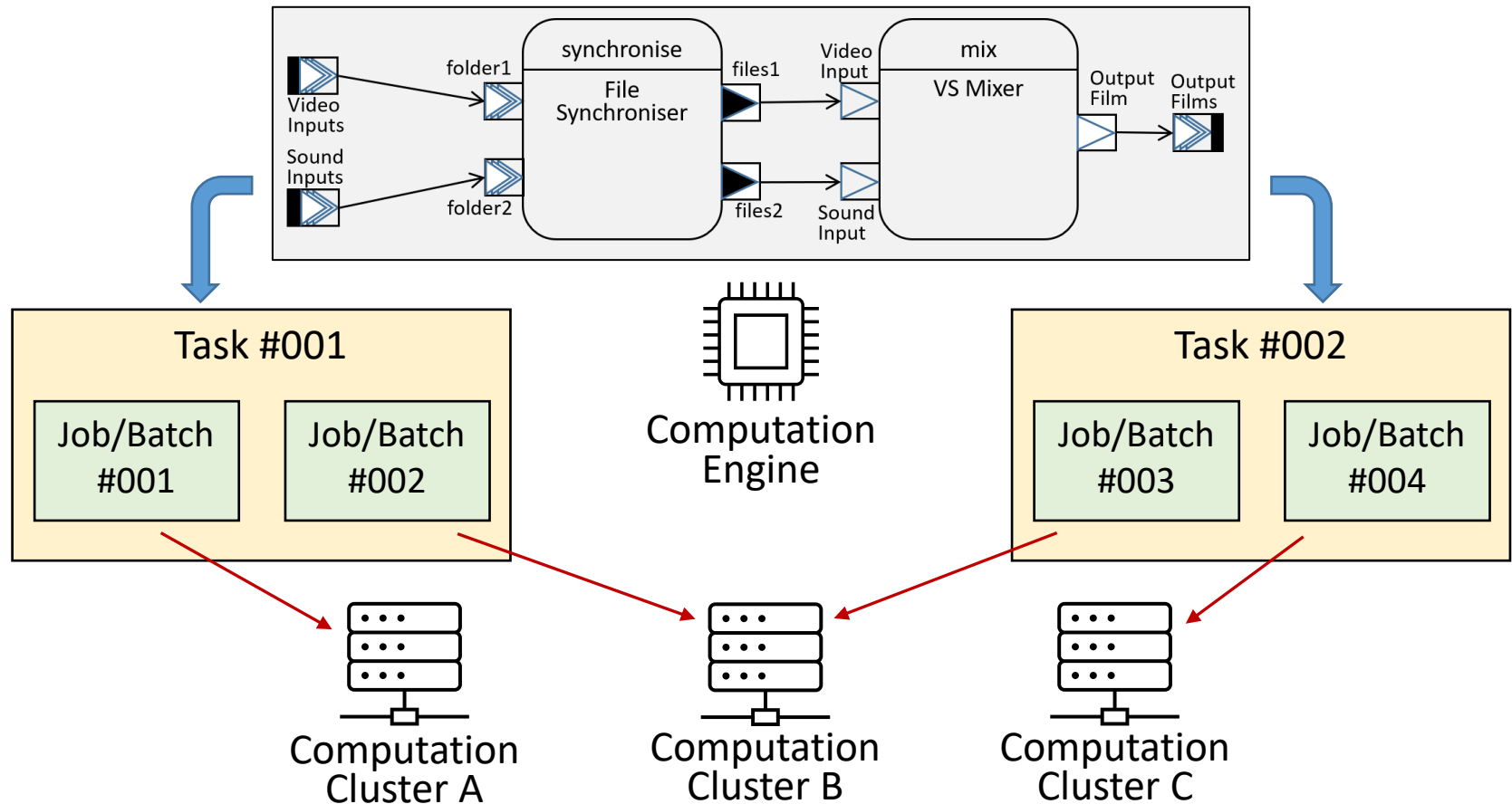
CAL Example – Multi VS Mixer

- Process many video-audio pairs
- Mix video and audio pairs into films
- Possible parallel execution of several instances of VS Mixer

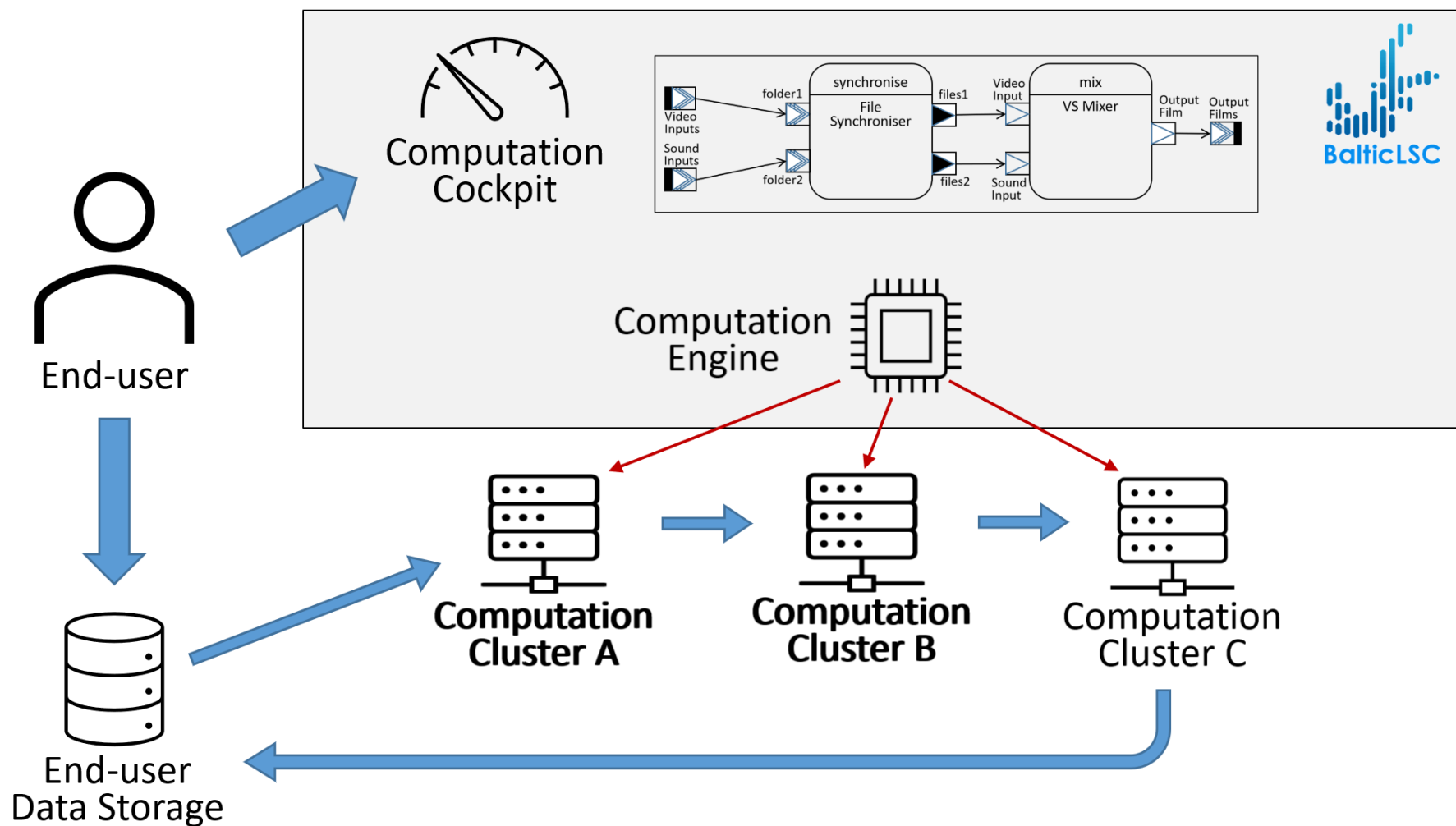


Running CAL Applications

- Application → Task
- Module Calls → Jobs (Batches)



How the BalticLSC Platform Works?



Warsaw University
of Technology



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