

Cloud access options by WS-PGRADE/gUSE

by Peter Kacsuk, Zoltan Farkas and Krisztian
Karoczkai

Current cloud support: Job submission into clouds

Three solutions:

- 1.SaaS by CloudBroker Platform

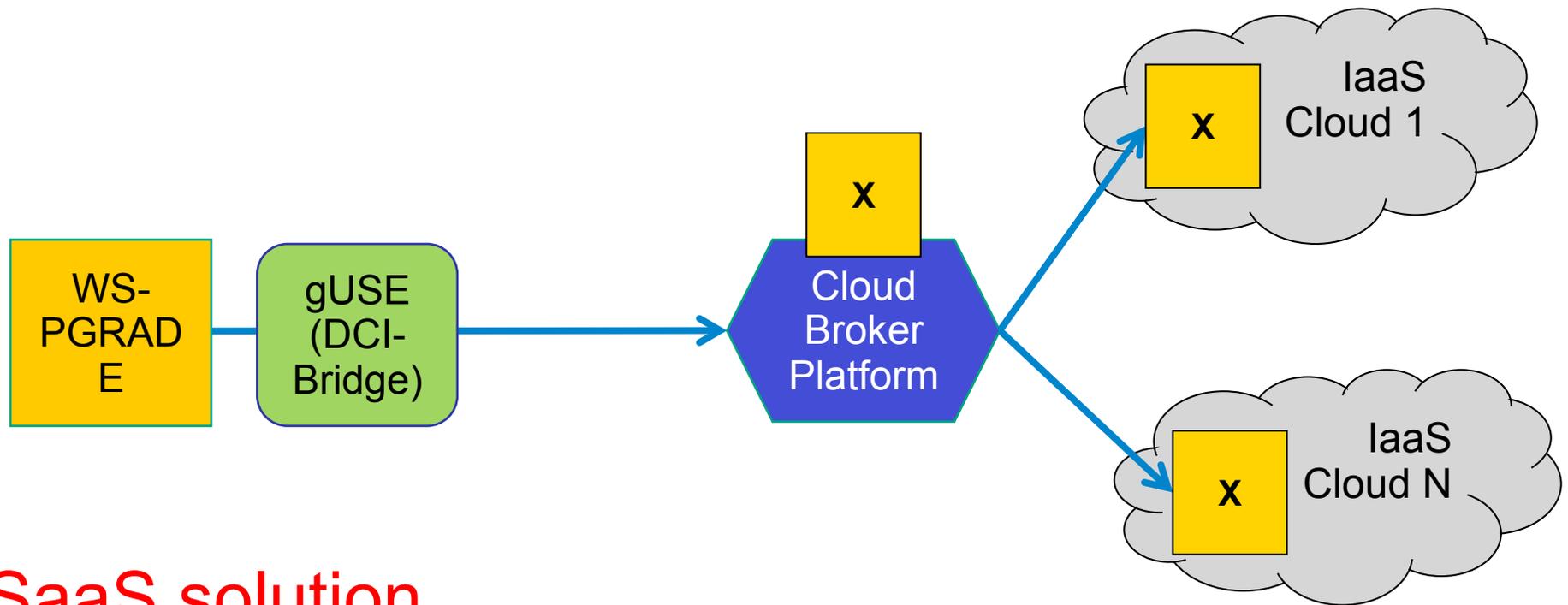
- 2.IaaS by CloudBroker Platform

- 3.Direct IaaS

1. With floating IP

2. Without floating IP (EGI FedCloud solution)

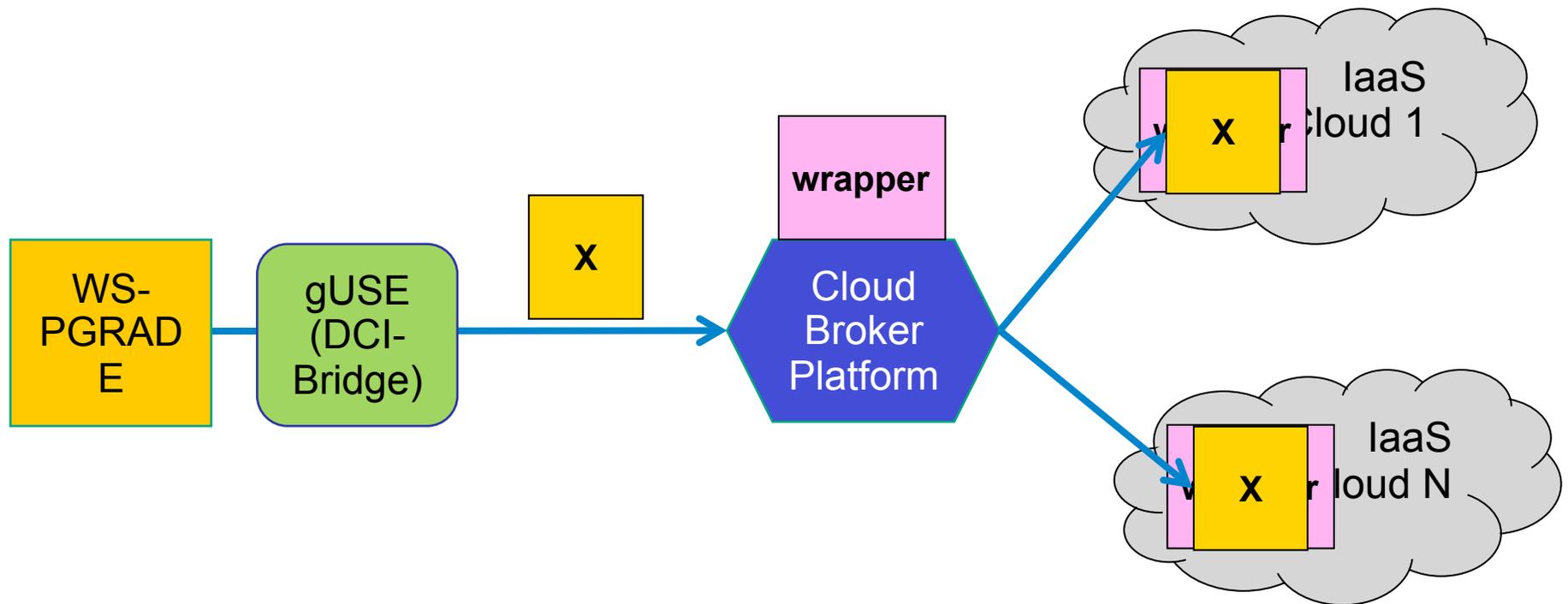
Integrated WS-PGRADE/CloudBroker Platform in Action



SaaS solution

- application X is pre-registered at CBP and in the Clouds connected to CBP
- X as node of a WS-PGRADE WF is called
- X is dynamically deployed and run in the IaaS clouds by CBP when gUSE initiates the WF node X execution.

Integrated WS-PGRADE/CloudBroker Platform in Action

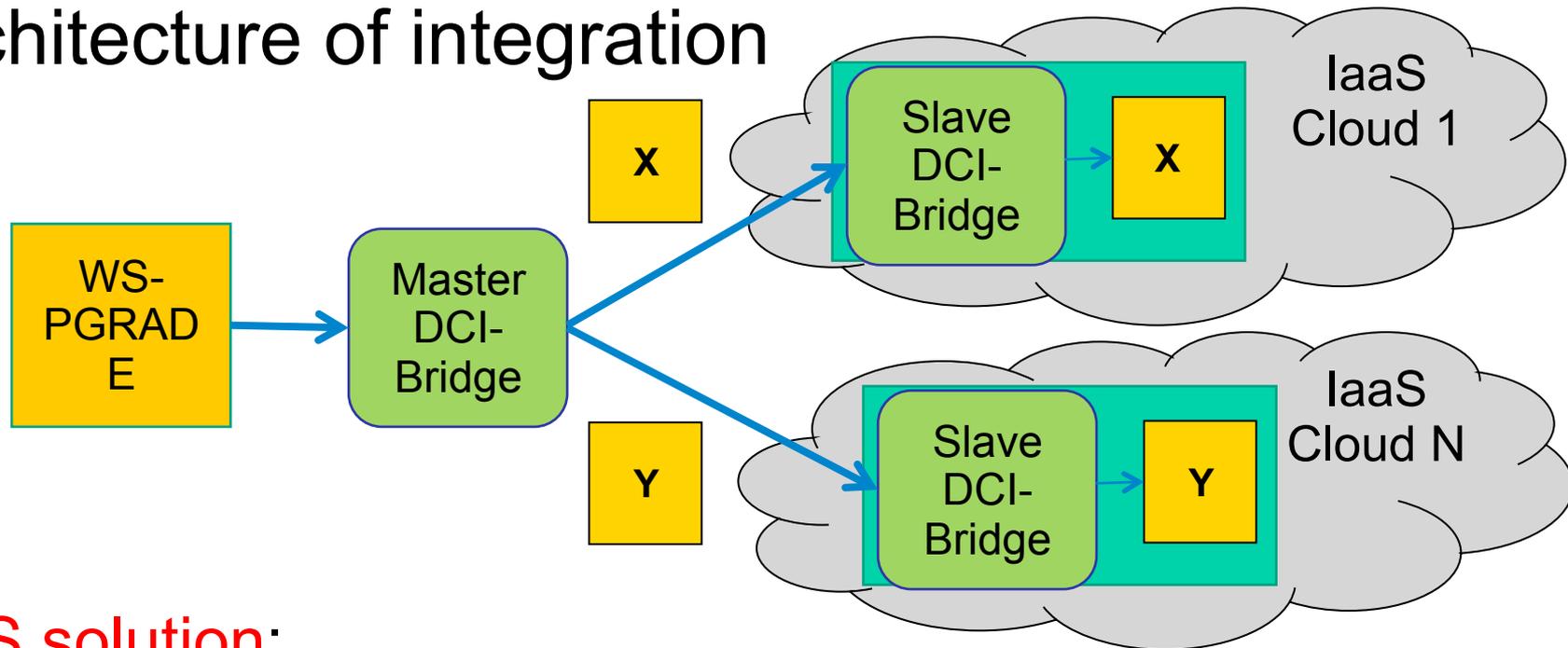


SaaS solution

- A generic wrapper application is pre-registered at CBP and in the Clouds connected to CBP
- X as node of a WS-PGRADE WF is called
- The wrapper with X is dynamically deployed and run in the IaaS clouds by CBP when gUSE initiates the WF node X execution.

Direct Access to IaaS Clouds with Floating IP support

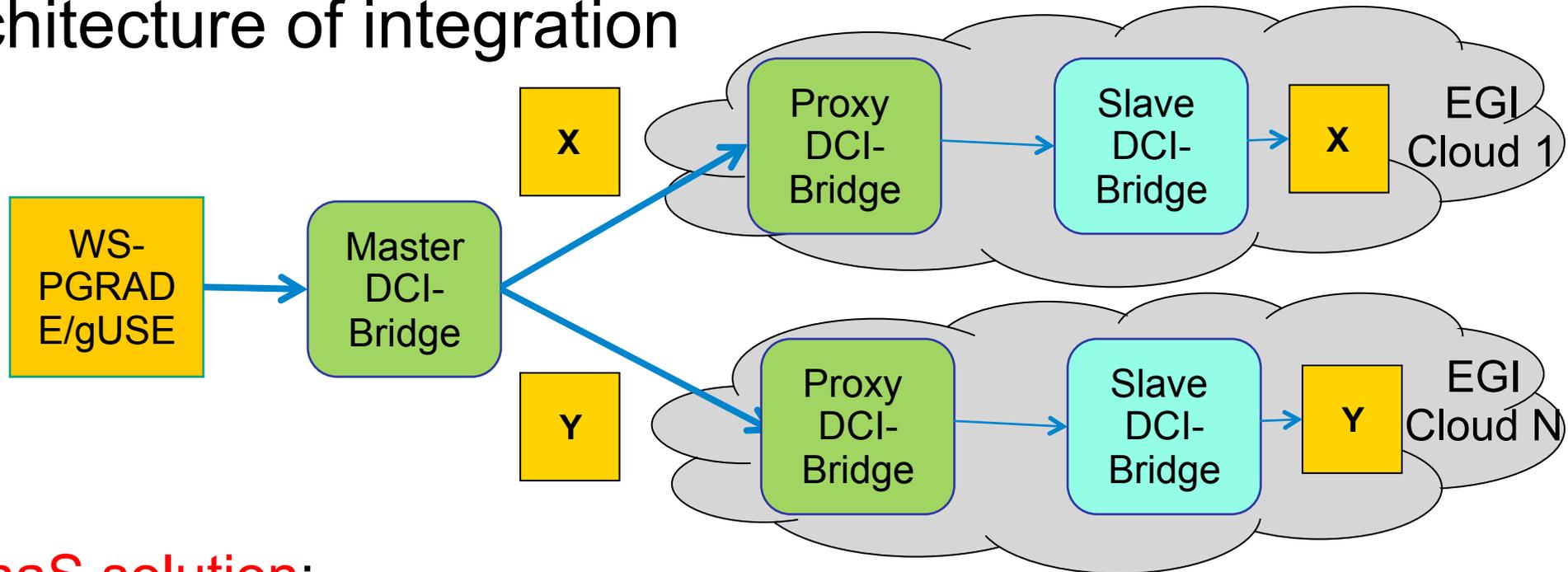
Architecture of integration



- **IaaS solution:**
 - any jobs can be run from WS-PGRADE workflows
 - Prerequisite: DCI Bridge VMI should be available for the target cloud
 - S-DCI-B should be accessible in general case via public IP -> Floating IP support is needed in the cloud
 - Supported clouds: Any cloud supporting EC2 protocol and Floating IP
 - The M-DCI-B on demand deploys as many S-DCI-Bs as many needed but maximum according to the user's quota

Access to Clouds with permanent DCI Bridge service (used for EGI FedCloud)

Architecture of integration



- **IaaS solution:**

- any jobs (X, Y, etc.) can be run from WS-PGRADE workflows
- P-DCI-B should run as a service on the EGI clouds since the Floating IP solution is not supported by rOCCI
- Slave DCI Bridge does not need public IP
- The M-DCI-B on demand deploys as many S-DCI-Bs as many needed but maximum according to the user's quota

WS-PGRADE/gUSE and EGI FedCloud configuration

Clouds of EGI FedCloud that are accessible from the
EGI FedCloud WS-PGRADE/gUSE service:

guse-fedcloud-gateway.sztaki.hu (facebook login)

- 9 sites runs the Proxy DCI Bridge according to APPDB)
- 4 out of these 9 were tested:
 - CESNET Cloud
 - IN2P3 Cloud
 - (INFN Padova)
 - (CETA-CIEMAT Cloud)

Meta-broker to distribute PS instances among several clouds

Release 3.7.1 - 15th June, 2015:

The main improvement of this gUSE version is the introduction of the **Meta-broker** solution. The use of Meta-Broker ensures the best resource selection for job submission: user can execute jobs in parallel in resources where the time of job executions is the shortest of all currently available resources (clusters, clouds or grids).

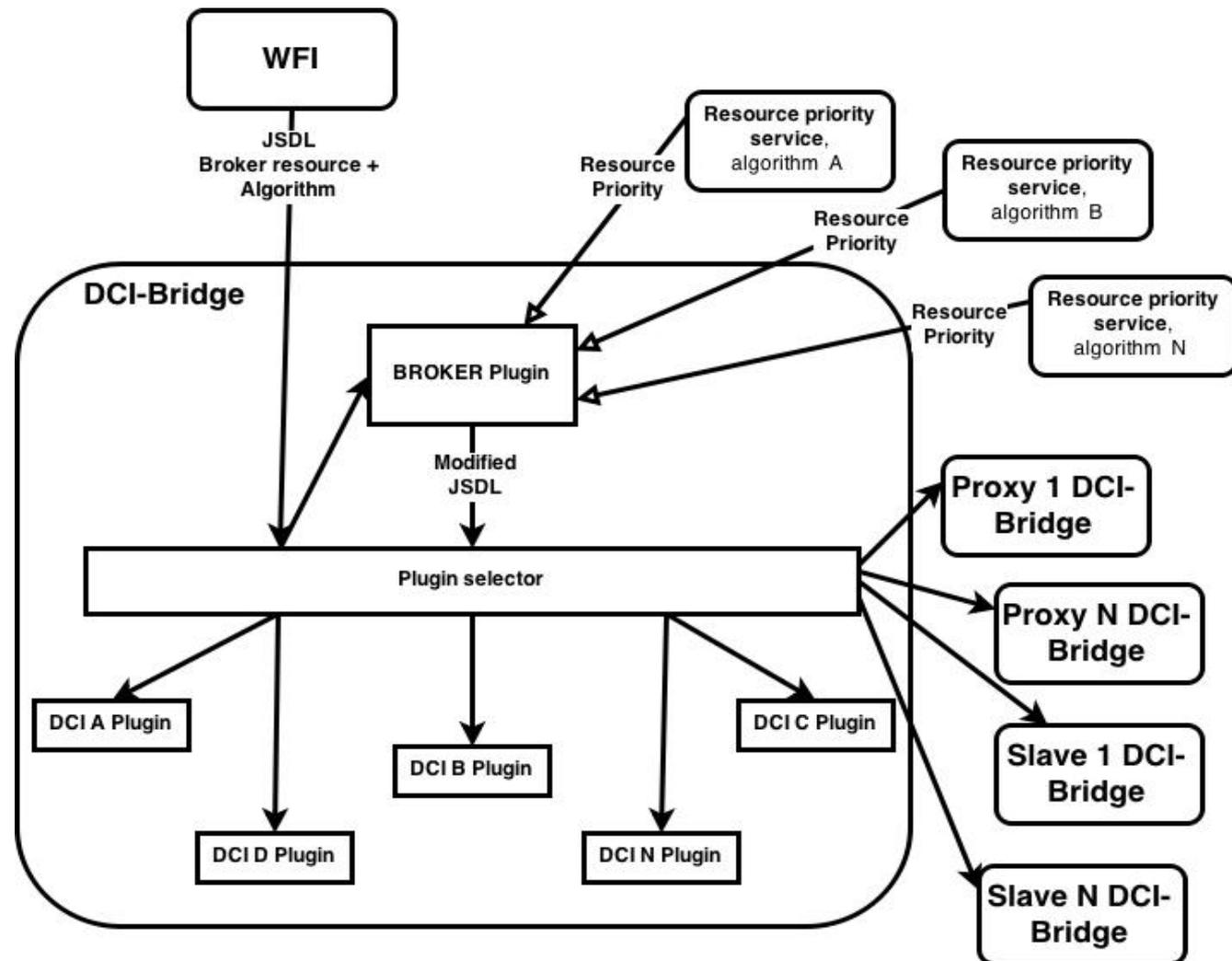
In previous WS-PGRADE/gUSE releases all the job instances of a PS WF node were running on the **SAME DCI** that was defined by the WF developer. **Now** the job instances can be distributed **among many different DCIs**.

For example, the job instances of a PS node can be distributed evenly in several clouds of EGI FedCloud infrastructure.

Meta-broker service to evenly distribute tasks in multiple clouds

Introduced Metabroker solution - enables the gateway to implement load balancing at the PS job level

Based on the new **Resource Priority Service**: integrated service to keep track of PBS resource performances



Meta-broker distribution of PS jobs in configuration time

For every PS node user can specify which clouds (or other types of resources) should be used

The screenshot shows a configuration window titled "Configure" with a close button (X) in the top right corner. The window has a light blue header and a white background. Below the header, there are two green input fields: "Job's name:" with the value "MulCross" and "Optional note:" with the value "Cross Product of input ports. Operation among inputs is Multiplication". Below these are four icons: a gear for "[Job Executable]", a padlock for "[Job I/O]", a document with a pencil for "[JDL/RSL]", and a document with a pencil for "[History]". A "Workflow Service Binary" section is visible, with a green checkmark and a question mark icon. The main configuration area is divided into sections: "Type:" with a dropdown menu set to "broker"; "Grid:" with a dropdown menu set to "default"; "Brokered Resources:" with three sub-sections: "cloud" containing three checked items: "LPDS cloud (256)", "SZTAKI cloud (64)", and "LPDS OCC1 (128)"; "glite" containing one checked item: "hungrid (16)"; and "pbs" containing one checked item: "c153-110.localcloud/ (256)". Below this is a "Replicate settings in all Jobs:" checkbox which is unchecked. "Kind of binary:" has radio buttons for "Sequential", "Java", and "MPI", with "Sequential" selected. "MPI Node Number:" has an empty text input field. "Executable code of binary:" has radio buttons for "Local", "Remote", and "Data/venue", with "Local" selected. Below this is a "Recently stored: ARI.sh" label and a "Choose File" button with "No file chosen" text. "Parameter:" has a text input field containing the letter "M".