Edinburgh
e-Science
TOE

Training Outreach and Education

http://www.nesc.ac.uk/training

NGS
National Grid Service

http://www.ngs.ac.uk

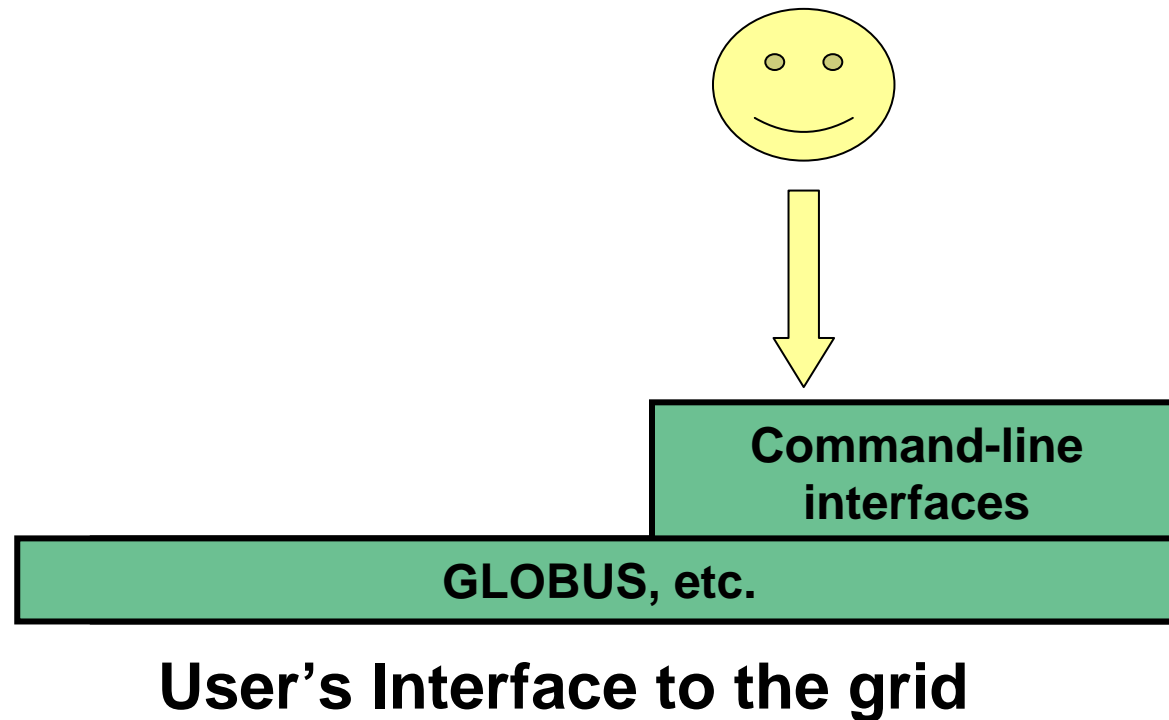# NGS computation services: APIs and Parallel Jobs

Policy for re-use

- This presentation can be re-used, in part or in whole, provided its sources are acknowledged.

- However if you re-use a substantial part of this presentation please inform training-support@nesc.ac.uk. We need to gather statistics of re-use: number of events and number of people trained. Thank you!!

Overview

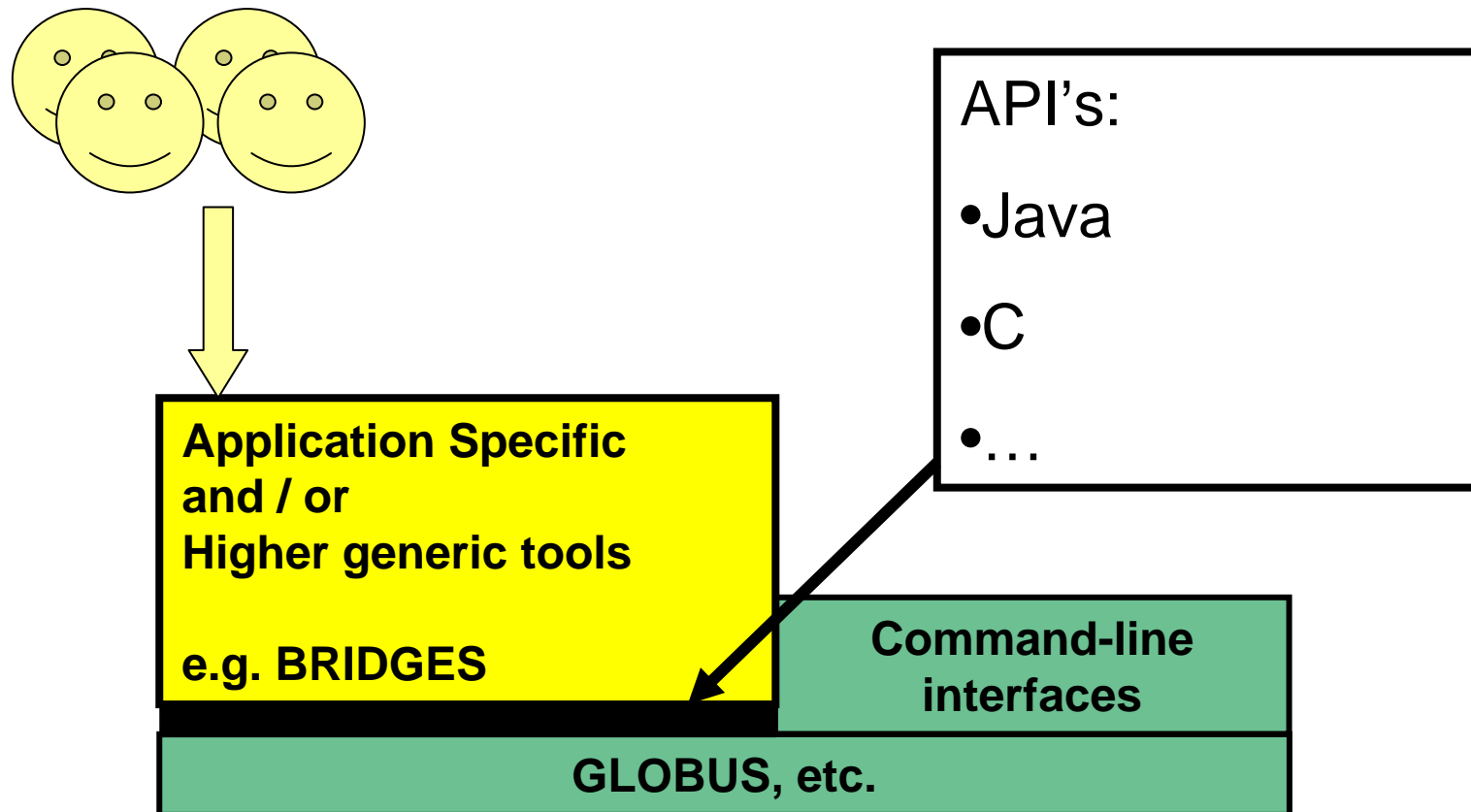- The C and Java API's to the low-level tools
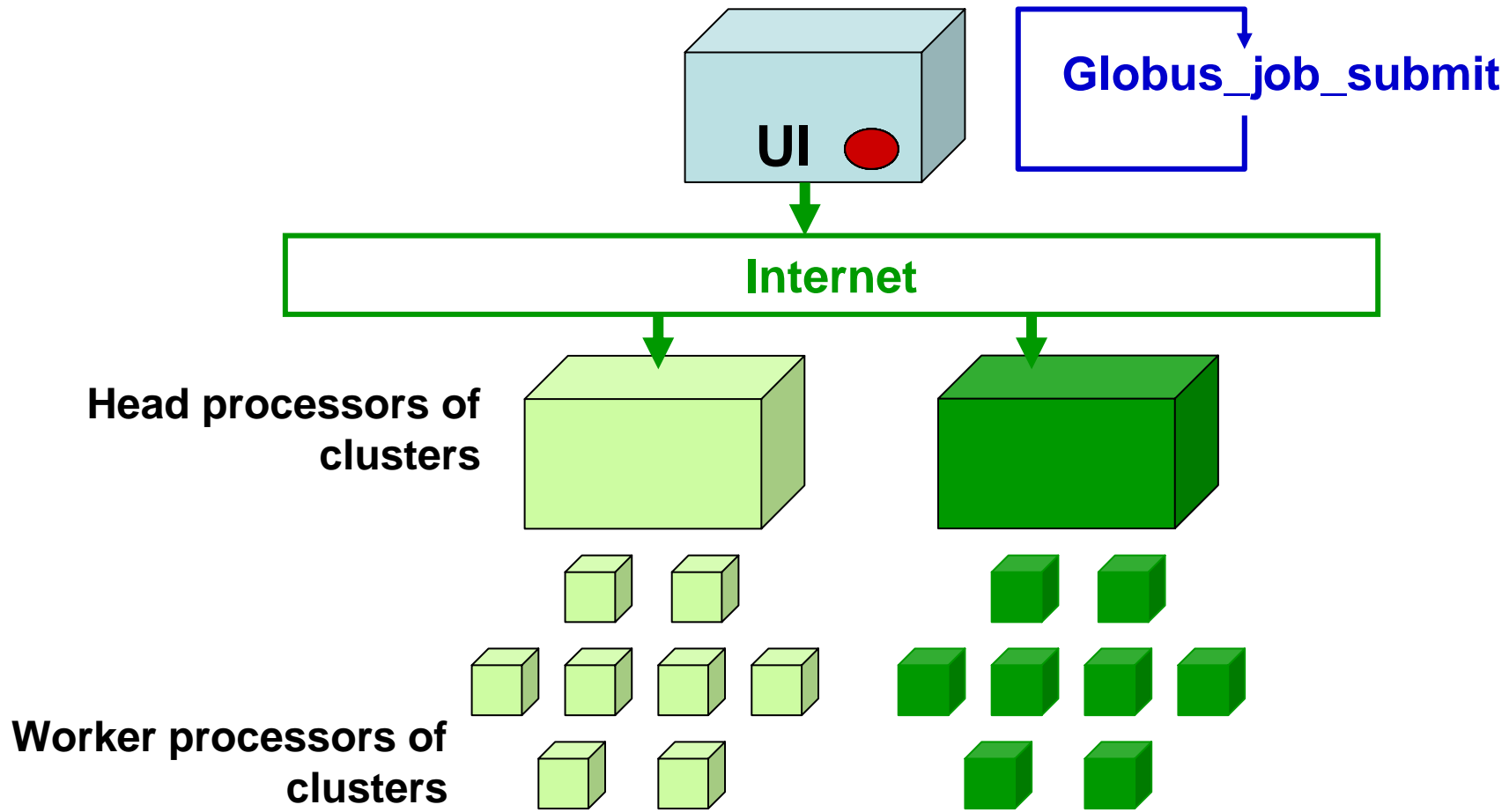- Using multiple processors

Job submission so far

Command-line interfaces

GLOBUS, etc.

User's Interface to the grid

Application-specific tools

NGS National Grid Service

API's:
- Java
- C
- …

Application Specific and / or Higher generic tools

e.g. BRIDGES

Command-line interfaces

GLOBUS, etc.

User's Interface to the grid

Available API's

- C http://www.globus.org/developer/api-reference.html

- "Community Grid" CoG http://www.cogkit.org/
  - Java, Python, Matlab
  - (very limited functionality on Windows – no GSI)

Non-communicating Processes

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UI

Globus_job_submit

Internet

Head processors of clusters

Worker processors of clusters

Processes run without any communication between them

Communicating Processes

UI ●   **Globus_job_submit**
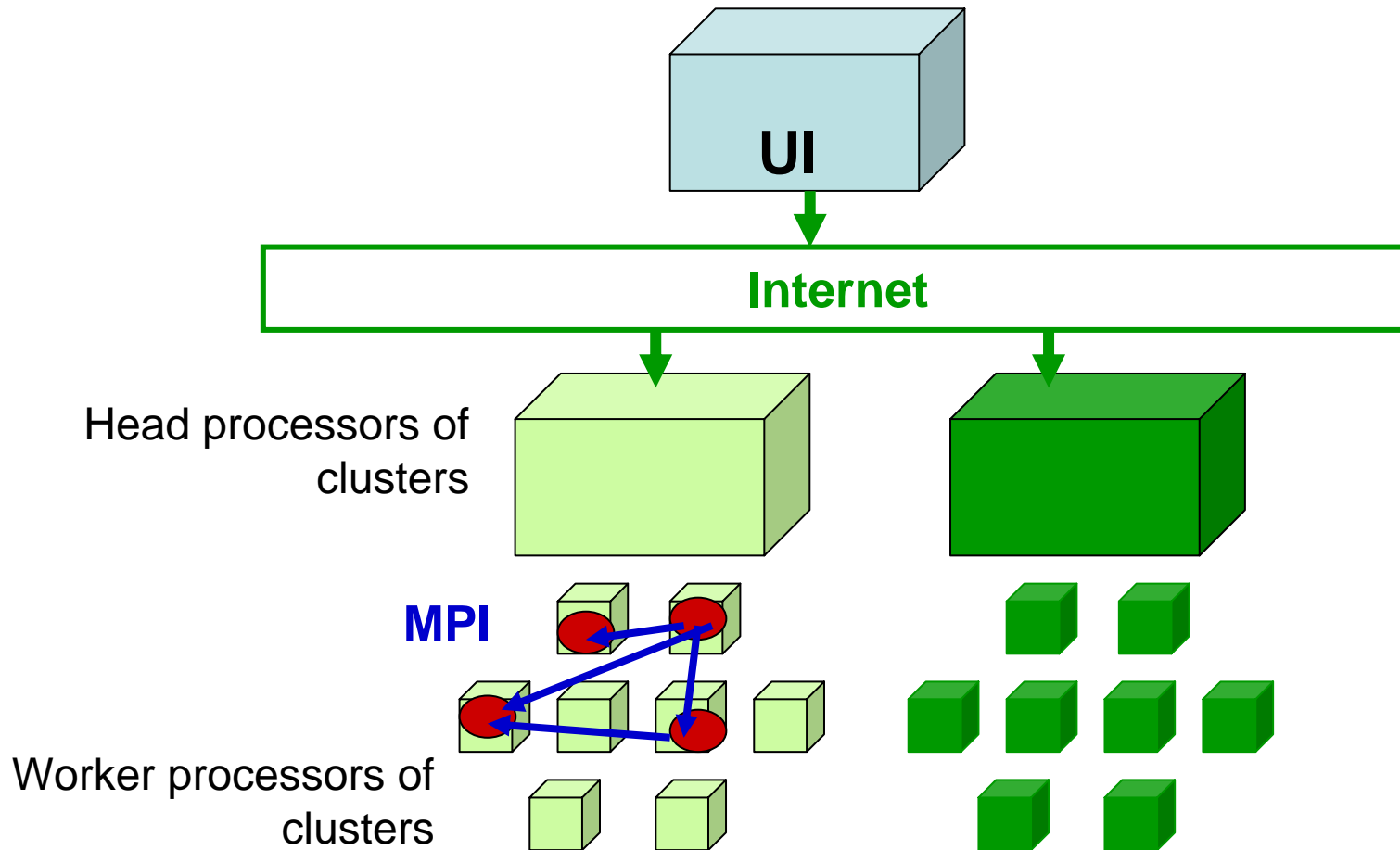
Internet

Head processors of clusters

Worker processors of clusters
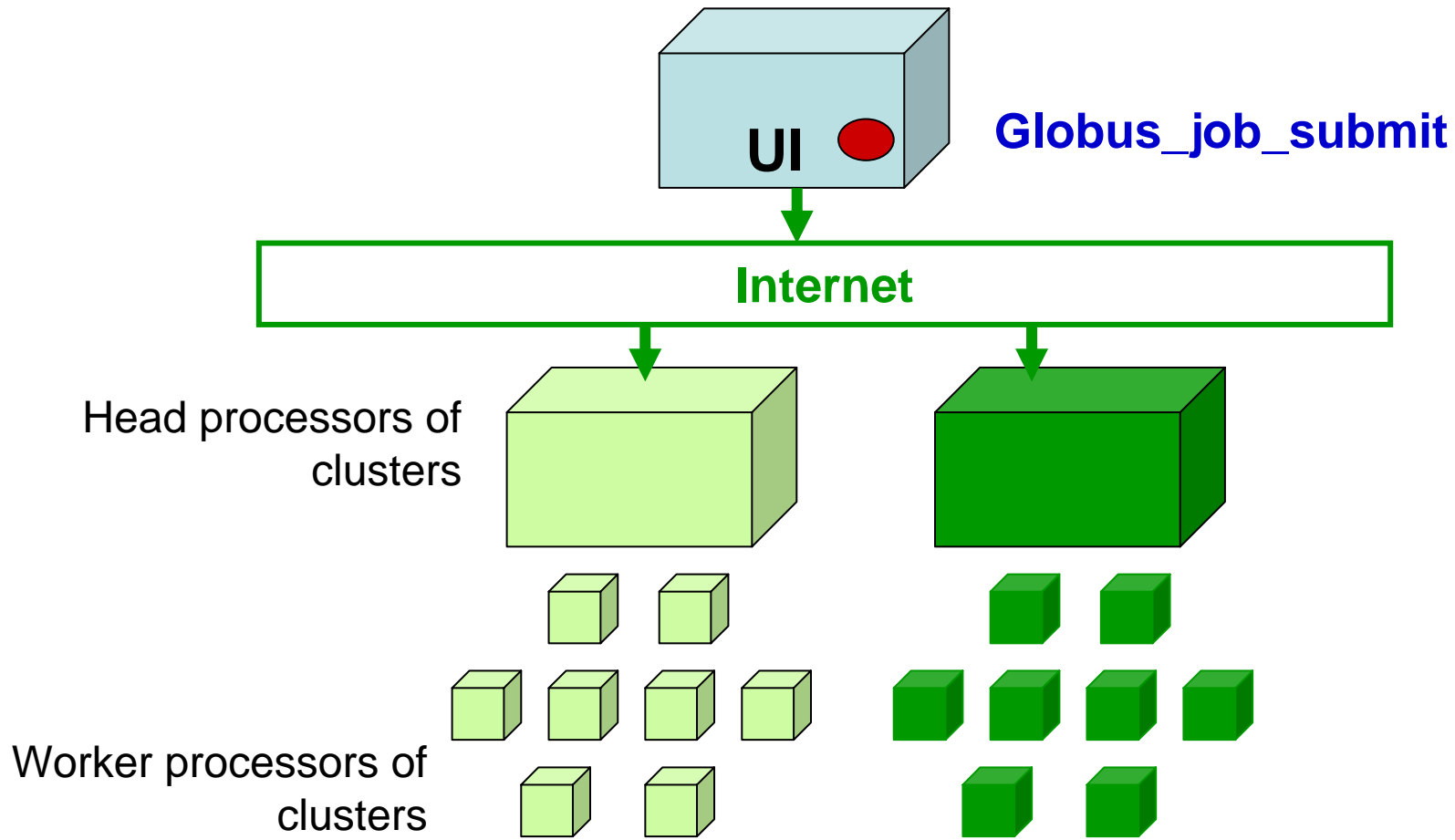
Processes send messages to each other – Must run on same cluster

Communicating Processes

Processes send messages to each other – Must run on same cluster

Modes of Parallelism

The NGS nodes open these routes to you – but you have to do a bit of work! (Grid is not magic!...)

- Non-communicating processes: on NGS, multiple executables run from a script on the UI
- Communicating processes: on NGS, you run one globus-job-submit command – but need to code and build program so it is parallelised
  - MPI for distributed memory
  - OpenMP, multithreading – only on a Cardiff node