

# Practical Experiences with User Account Management in Clusterix

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## Requirements

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- **Ease management of user accounts**
  - We expect many virtual organizations with hundreds of users. For the time being, VO is associated with physical institution.
  - Maintaining personal user accounts on multiple nodes is extremely hard.
  - Grid-mapfile requires too much administration time
- **Special emphasis on dynamic clusters**
  - static accounts for each user are not appropriate for dynamic clusters
- **Enable combined, fine-grain and flexible authorization**
  - Need for combining security policies of institutions (VOs) and resource owners
  - Reusing already implemented authorization services and mechanisms
- **Enable accounting and tracking user activities**
  - This is crucial for production grids shared between many institutions
  - Guest or anonymous accounts are insufficient
  - No mechanism for gathering accounting data from multiple nodes

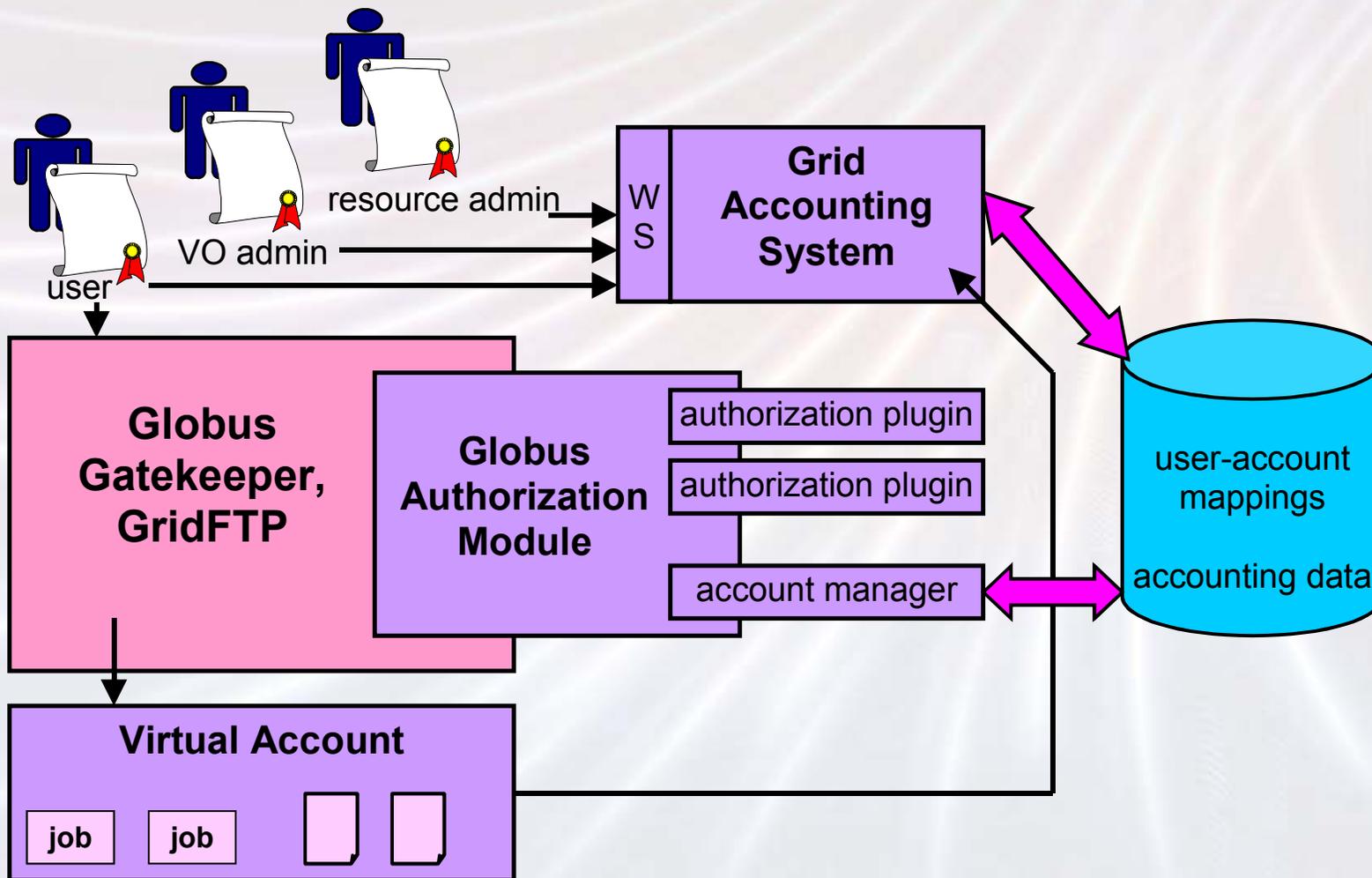
## Virtual User System

- VUS is an extension of the system that runs users' jobs that allows running jobs without having an user account on a node. The user is authenticated, authorized and then logged on a 'virtual' account (one user per one account at the time). The history of user-account mapping is stored, so that accounting and tracking user activities is possible.

## VUS in Clusterix

- Implemented as Globus 'gridmap callout', modifies authorization of Gatekeeper and GridFTP services.
- Integrated with Resource Broker (GRMS).
- Uses PostgreSQL database for storing mapping and accounting data locally.
- Current testbed: 9 static local clusters, 1 authorization server (VOIS), about 50 users.
- Target: more clusters (12 static, several dynamic), VOIS server in each institution, hundreds of users.

## VUS on Grid Node



## How the requirements are fulfilled?

- **Ease management of user accounts**

- Administration effort in gridmap model:

$$\begin{aligned} & \text{no\_of\_users} * \text{no\_of\_systems} \\ & \approx 50 * 9 = 450 \end{aligned}$$

- Administration effort with VUS:

$$\begin{aligned} & \text{no\_of\_users} + \text{no\_of\_systems} * \text{no\_of\_v\_ccounts} \\ & \approx 50 + 9 * 10 = 140 \end{aligned}$$

- Easy to lock or remove user access
- User effort reduced - have to apply for account only in one place

## How the requirements are fulfilled?

- **Dynamic clusters**
  - VUS requires configuration to be done once, no further need for creating/removing accounts
  - The configuration is simple and is automated by configuration wizard

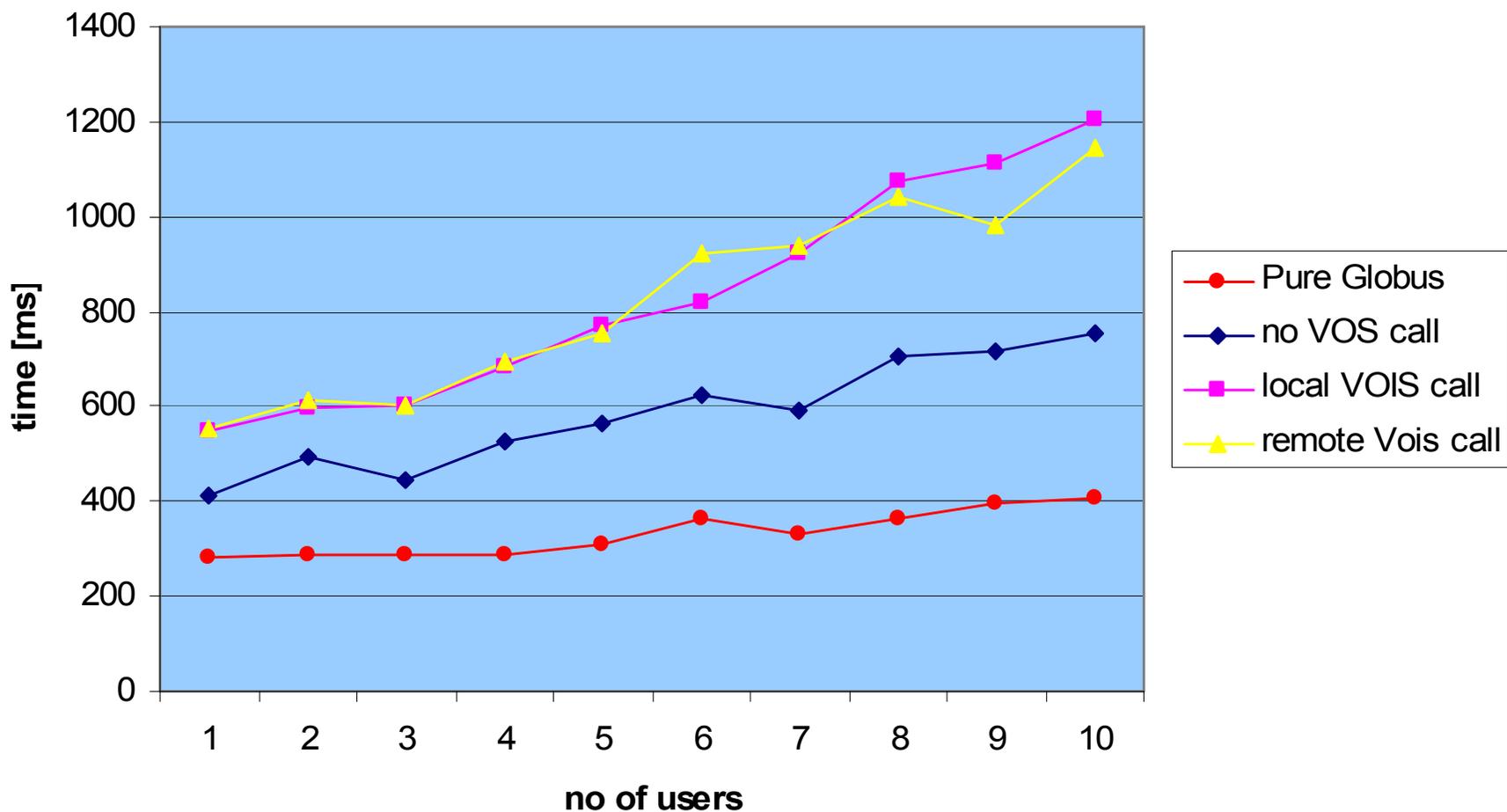
## How the requirements are fulfilled?

- **Combined, fine-grain and flexible authorization**
  - VOIS in each partner institution reflects security policy of the institution
  - Cluster administrator decides about privileges attached to accounts and attaching accounts to organizations. He can also ban single users or sub organizations.
  - Authorization is plugin based, several plugins are implemented, easy to implement a new one
- **Enable accounting and tracking user activities**

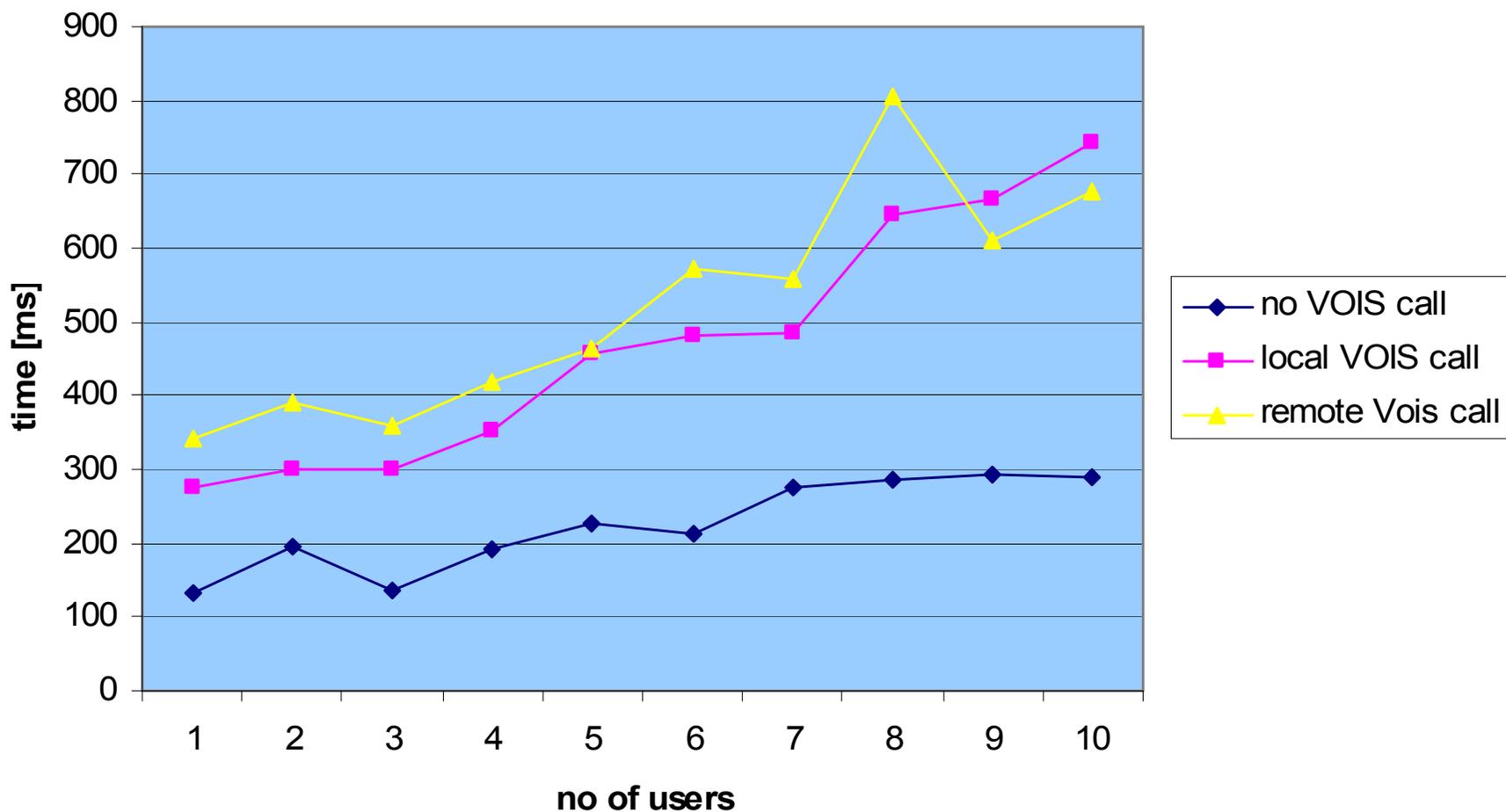
## How the requirements are fulfilled?

- **Accounting and tracking user activities**
  - History of mappings user-account is stored in a database, so it is possible to check who performed any action
  - The standard UNIX accounting data is stored automatically in conjunction with a user (not account).

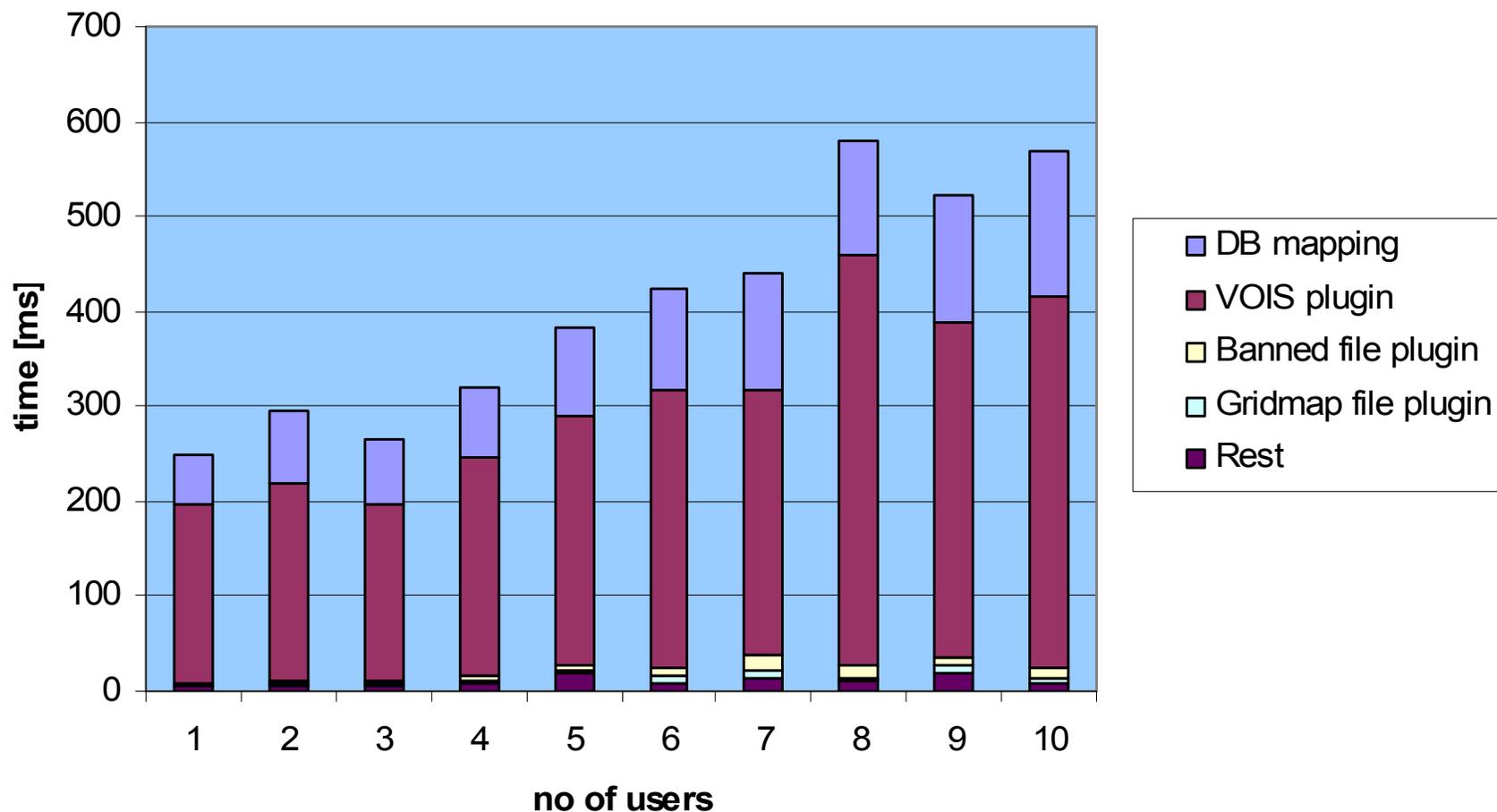
## User delay



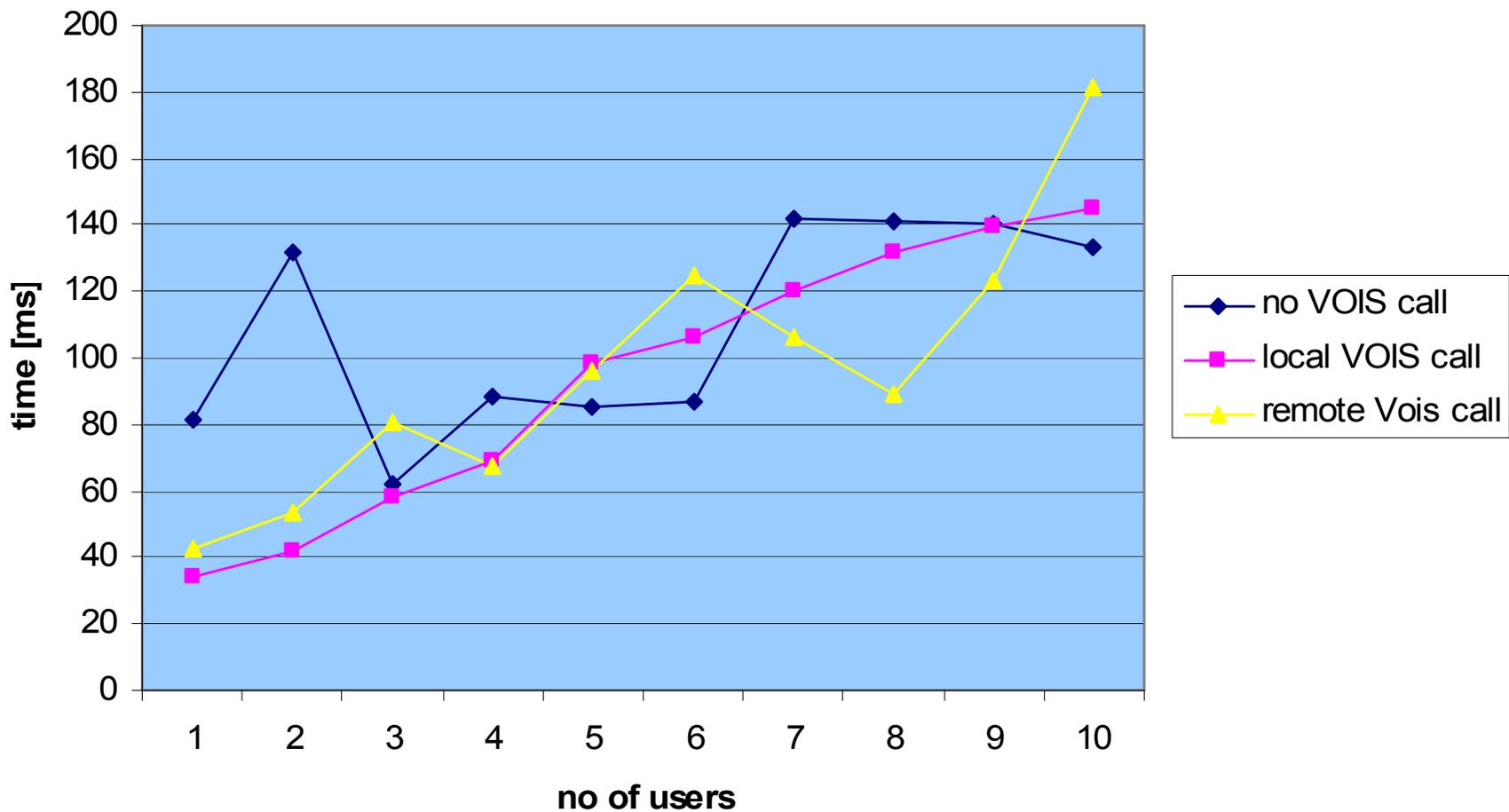
## VUS callout



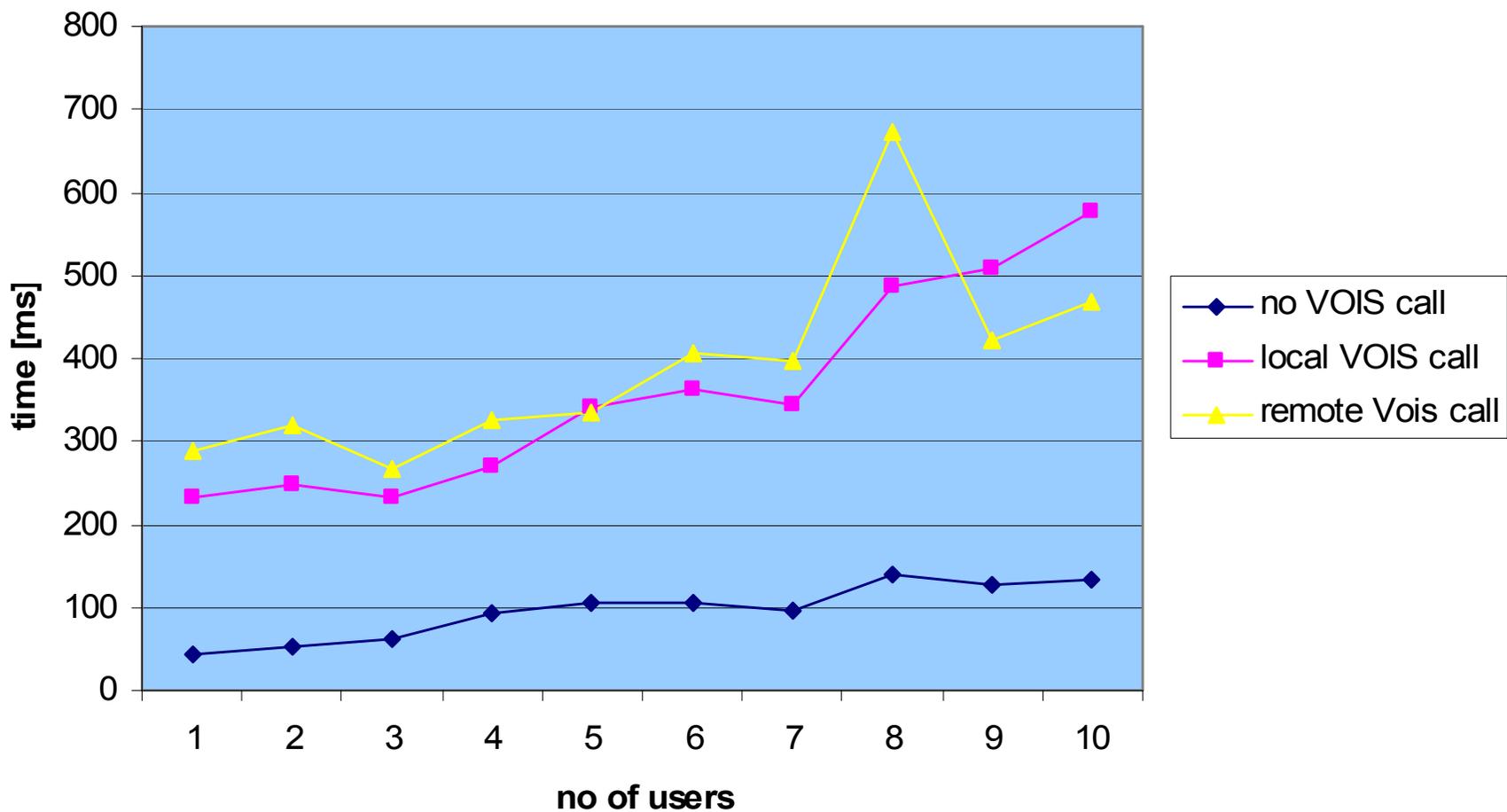
## Average execution of elements



## Database mapping



## VOIS plugin



## Further work

- Deployment of VUS on more clusters
- Deployment of many VOIS servers
- Automatic accounting data exchange in GGF Resource Usage format



Thank you!

<http://www.clustrix.pl>

<http://vus.psnc.pl>

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