

# User communities adapting the SCI-BUS gateway technology

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## Description of Work

SCI-BUS has developed a science gateway framework called as gUSE/WS-PGRADE. This gateway framework is used by the following 11 partner communities to build their own science gateway:

1. International seismology community
2. Helio-physics community
3. Swiss systems biology community of the SystemsX.ch project
4. German MoSGrid computational chemistry and bioinformatics community
5. Biomedical researchers community of the Academic Medical Centre of the University of Amsterdam
6. Astrophysics community
7. PireGrid SMEs community
8. Business process modelling community involving a wide range of areas such as finance, healthcare, government, production, robotics and emergency
9. Blender rendering community
10. Citizen web-2 community
11. Public application developer community

All these gateways are established at production level and serve between 10 and 10.000 users as shown by the table of gateways related to SCI-BUS at <http://www.sci-bus.eu/science-gateways>. There is description and a video on these gateways at <http://www.sci-bus.eu/application-specific-portals>.

Another 6 gateways are under development by SCI-BUS sub-contractor communities. These are:

1. G.V. Kurdyumov Institute for Metal Physics (Ukraine)
2. Institute of Physics Belgrade(Serbia)
3. Leiden Institute for Advanced Computer Science (Netherlands)
4. NVG Scientific Sdn Bhd (Malaysia)
5. Rudar Bošković Institute (Croatia)
6. The Meteorology Group of Universidad de Cantabria (Spain)

The gateways developed by these communities are also shown at <http://www.sci-bus.eu/science-gateways>.

5 associated partners are collaborating with SCI-BUS in order to build their gateways based on the SCI-BUS gateway technology. These are:

1. Institute for Informatics and Automation Problems, National Academy of Sciences of the Republic of Armenia
2. SAVANNAH SIMULATIONS AG (Switzerland)
3. Technical University of Sofia (Bulgaria)
4. Quantitative Biology Center, Tübingen (Germany)
5. University of Portsmouth (UK)

Several NGIs use SCI-BUS technology to establish a gateway for their national grid and/or cloud. Here are some of them:

1. Greek NGI
2. Hungarian NGI
3. Italian NGI (IGI Portal)
4. Malaysian NGI
5. Turkish NGI, etc.

SCI-BUS also actively collaborates or collaborated with the user communities of other EU projects to help them build their own gateways. These projects are agINFRA, CloudSME, DRIHM, ER-Flow, EDGI, IDGF-SP, SHIWA, VERCE, VIALACTEA. For example, the SHIWA Simulation Platform uses the SCI-BUS gateway technology to execute workflows developed in 10 different workflow systems (e.g. Taverna, Galaxy, Kepler, etc.)

The gateways used by these communities access the following the DCIs:

- Local and remote clusters accessed by queuing systems (PBS, LSF, SGE, MOAB)
- Local and remote supercomputers
- Local and volunteer DGs (BOINC)
- Grids (ARC, gLite, Globus, UNICORE)
- Academic Public and Private Clouds (OpenNebula, OpenStack, Eucalyptus, etc.)
- Public Commercial Clouds (Amazon, IBM)

All these gateways are established as one of the 4 different gateway types supported by the SCI-BUS technology:

1. Generic purpose gateway (typically used by power users to develop grid and cloud applications and develop workflows). The NGI gateways are typically belong to this type, e.g. Greek NGI gateway, IGI Portal, etc.
2. End-user mode gateways. These are typically used by end-user scientists for running pre-registered domain-specific applications with robot certificates. A typical example is the autodock gateway jointly developed by SZTAKI and Univ. of Westminster: <https://autodock-portal.sztaki.hu/>
3. Customized, domain-specific gateways. These typically enhance the WS-PGRADE user interface with domain-specific portlets using the ASM API developed by SCI-BUS. Most of the gateways developed by SCI-BUS partners, associated partners and sub-contractors belong to this class.
4. Workflow executor gateway. This gateway has no user interface but able to execute workflows developed by the generic purpose SCI-BUS gateways submitting them from an existing domain specific gateway. This kind of gateway is recommended if the user community has already a gateway but would like to extend it with workflow execution on various DCIs.

## Relevant URL (if any)

<http://www.sci-bus.eu/>  
<http://sourceforge.net/projects/guse/>

## Printable Summary

SCI-BUS develops a gateway framework technology that is application and DCI neutral, i.e., it can be used by many user communities for many different DCIs including clouds, grids, clusters and supercomputers. Of course, when a user community would like to apply the gateway framework technology they have to customize and adapt it according to their needs and hence SCI-BUS also provides the required customization technology. As a result user communities can easily and quickly create their own domain-specific gateways based on the framework and its customization technology.

Inside SCI-BUS 11 different user communities create gateways based on the SCI-BUS gateway technology. Another 6 subcontractor communities develop gateways. There is an associated membership program in SCI-BUS based on which another 5 communities use SCI-BUS technology as associated members. All these partner, subcontractor and associated partner communities can be found in the SCI-BUS web page: <http://www.sci-bus.eu/introduction>

SCI-BUS also actively collaborates or collaborated with the user communities of other EU projects to help them build their own gateways. These projects are agINFRA, CloudSME, DRIHM, ER-Flow, EDGI, IDGF-SP, SHIWA, VERCE, VIALACTEA.

The SCI-BUS core technology (gUSE/WS-PGRADE) is open source, available at sourceforge: <http://sourceforge.net/projects/guse/>. Many communities, NGIs download and apply or further extend it to create their own gateway. For example, the Greek NGI was one of the early adaptors of gUSE/WS-PGRADE to build gateway for the Greek NGI. A very successful further extension of the SCI-BUS technology was done by the Italian NGI that created the IGI Portal on top of gUSE/WS-PGRADE. The popularity of the core gateway software has been increasing since its appearance on sourceforge. Just in May 2013 there were more than 1000 downloads and the overall number of downloads is close to 10.000 (<http://sourceforge.net/projects/guse/files/stats/timeline>).

The roadmap of further developing the SCI-BUS gateway framework can be accessed at the SCI-BUS web page: <http://www.sci-bus.eu/guse>. We encourage communities who use and further develop the SCI-BUS gateway framework to contribute to the roadmap and give back their developed code to the SCI-BUS community and to all its users.

SCI-BUS also creates a portlet repository where all those Liferay portlets developed by SCI-BUS partners and sub-contractors will publicly be available. In this way communities also using Liferay based gateways can take benefit of downloading portlets from the SCI-BUS Portlet Repository. We encourage these user communities to similarly upload their own developed Liferay portlets into the SCI-BUS Portlet Repository and make them publicly available for other user communities.

SCI-BUS also uses the SHIWA Workflow Repository (maintained by ER-Flow: <http://shiwa-repo.cpc.wmin.ac.uk/shiwa-repo/>) to upload and publish the workflow applications developed under any of the SCI-BUS gateways. In this way other communities using SCI-BUS gateways can take advantage not only using the gateway technology and the portlets but also the workflow applications. All these communities can collaborate via the gateway framework technology, portlet repository and workflow application repository. This dimension of collaboration among European communities and projects will tremendously increase the competitiveness of these communities and projects compared with others working in isolated way.

Finally, this large set of collaborating projects and communities will also significantly contribute to the sustainability of all these commonly used technologies (Gateway framework, portlet repository and workflow repository).

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