

Highlights

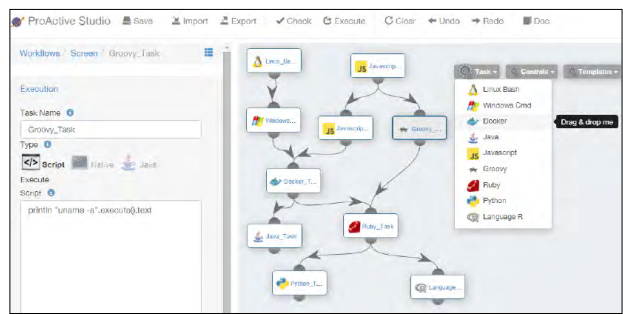
Workflows ease task parallelization, running them on resources matching your constraints

Intuitive web interfaces are provided to design and execute your job workflows, and manage your resources. Powerful APIs allow easy integration within your solution

Federate your existing resources, add extra resources from clouds. Reduce costs with energy saving strategies and elasticity

Overview

ProActive Workflows & Scheduling allows you to **easily execute all your company jobs** and business applications, monitor activity and quickly access job results. Allowing your IT to **scale up and down according to your actual workload**, it will ensure the optimal match between disponibility and cost. It ensures more work done with fewer resources, managing heterogeneous platforms and multiple sites with advanced usage policies. Thanks to its flexibility, **ProActive Workflows & Scheduling** will help you in any expansion, federation and integration project.



Workflow Studio: Design efficient workflows for all your tasks

Learn More



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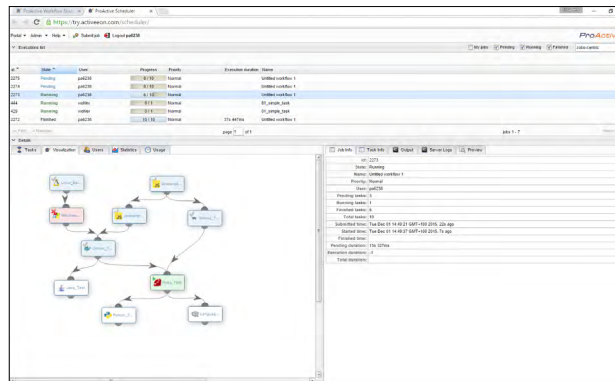
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activeeon.com/workflows-scheduling



Scheduler Portal: Run, monitor and manage workflows execution

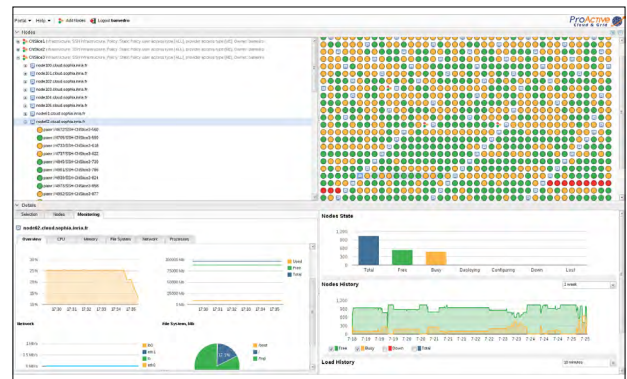
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Resource Manager Portal: Unify and manage all your resources

Main Features

User interfaces	A web portal with three dedicated interfaces allows workflow creation, job management and resource management. Web interfaces simplify deployment and updates to clients as only a web browser is required. Command line interface allows console usage and script integration. A job planner user interface is available to associate a calendar rule with a workflow. Machine Learning Open Studio interface for developers and data scientists to easily build, train and deploy machine learning models at any scale.
Workflows	Workflows help for comprehension and maintainability of jobs. They can be created with our graphical web editor or in xml format. It supports complex structures with conditional statements, loops and replication. Data movements can be specified as well.
Tasks	All languages are supported: scripts (javascript, python, ruby, bash, etc.), Java classes and system executables. A single task can also be executed on multiple nodes at the same time, as for MPI and OpenMP.
Resource selection	Selection scripts make resource selection really flexible. Specify any kind of resource constraint for you task, like a number of cores, the local presence of a particular dataset or the currently available network bandwidth.
Scheduling	Prioritization, planification and recurrence are available for the user's jobs. Default scheduling policy is FIFO but for specific needs, custom policies can be added as extensions.
Placement rules	Placement of the task to execute can rely on a combination of multiple factors, including constraints attached to a task (like OS version), proximity or exclusion rules.
Resource management	Resource provisioning is handled by a various set of extensible policies to offer the highest rate of flexibility. For each resource (or set of them) you can apply static policies, as well as capacity planning, auto-scaling or on-demand policies.
Monitoring	Monitoring helps you troubleshooting any issue you may experience during execution or development of your job workflows. It is also useful to keep an eye on the status of the whole ProActive platform.
Open API	A RESTful API is available for users and administrators. Web portals are built on top of it, ensuring that all functionalities are accessible through this API. There is also SDKs for Java, C# and Python, with advanced functionalities such as events and disconnected mode.

Fault Tolerance

Recover Failed Jobs	If a task fails, you can automatically retry task execution several times, pause the whole job or only a sub part of it. Then, multiple resume strategies are available to recover job execution automatically or after a manual intervention.
Task Failures	Attach clean scripts (in any language) to your task to specify what to do if execution fails.
Notifications	Be notified immediately in case of failure through email or external services like your internal messaging service.

High Availability

Node failure	If a node is lost for any reason, failure is detected, and the task that was eventually running on it is re-scheduled to another valid and available node. This in order to guarantee full job execution.
Infrastructure	Many infrastructure policies are available to manage fault tolerance: automatic tentative to recover lost nodes, or deploy new nodes on local or external infrastructures to maintain system capacity.
Disaster Recovery	Server state is fully backed on a database, to ensure resuming of computations in case of crash without any job loss.
Zero Down Time	Setup your system with High Availability in mind with primary and failover configurations.

Security

Authentication	User authentication can rely on your existing directory service. ProActive is compatible with LDAP and Active Directory. Different roles can be defined to allow a precise set of actions.
Firewalls	Splitted networks configurations are possible thanks to our software router which can use identified secured flows between system components in order to be compliant with the most secured firewall configurations.
Communication	All communications between system components can be encrypted (i.e. web portals, server, nodes and task). A key is generated to secure data transfers for every single task.

Scalability

Infrastructure	ProActive is designed for large scale infrastructures. It quickly dispatches workloads over 10,000 nodes infrastructures.
Workflows	Build very large workflows without performance loss. For example, it takes 30 seconds to dispatch 1,000 tasks over 1,000 nodes. Submit a single job with 20,000 tasks in 1.2 seconds.
Performance	ProActive still offer low response time even with a lot of pending jobs. It takes 13.5 seconds to submit and execute a high priority job over a 1,000,000 jobs queue. Typical submission time for a single job is 0.5 seconds.

Big Data

Multi-disciplinary jobs	Run multi-disciplinary jobs with advanced execution control using on-demand Big Data platforms deployment and configuration like Hadoop, Spark, Hive, Pig and ElasticSearch.
Resource Management	Interface with legacy Hadoop resource managers like Yarn or Mesos, and get extra features from ProActive, including advanced placement strategies, and resource management policies.

Cloud Infrastructures and Docker Containers

Public Clouds	Increase your workload capacity with public Clouds seamless integration. Costs can be optimized using on-demand resource acquisition and cloud provider pricing model. ProActive support most common services like Amazon EC2, Microsoft Azure, IBM Bluemix, Softlayer, Google Compute and Rackspace.
Private Clouds	Aggregate all your resources with our set of infrastructure connectors. Both physical and virtual infrastructures are available, and specific resource usage policy can be defined for each. ProActive supports most common platforms like VMWare vSphere, OpenStack, Microsoft Hyper-V and Proxmox.
Docker Containers	Easily specify a Docker container as an execution environment for a task. ProActive automates the management and Deployment of Docker containers.

Infrastructure

Multiplatform	ProActive supports heterogenous environments with Microsoft Windows, Linux and MacOS.
Legacy Schedulers	Interface with legacy schedulers such as PBS Pro, Slurm or Oracle Grid Engine / SGE.
Storage	POSIX file systems (local, NFS, HDFS, Lustre, ...) Remote access: FTP, SSH Dataspace virtual file system
Energy saving	According to the resource management policy, machines can be started or stopped automatically to satisfy your energy saving guidelines.

Requirements

Server side	Minimum: 2 cores, 4GB RAM, 20GB Storage OS: Linux (any distribution), Windows (7,8,10, Server 2003, 2008, 2012), Mac OS X Physical or virtual machines
Node side	Minimum: 1 core, 512MB RAM, 1GB Storage OS: Linux (any distribution), Windows (7,8,10, Server 2003, 2008, 2012), Mac OS X Physical or virtual machines
Client side	Modern web browser: Chrome, Firefox, IE10+, Safari