# API of the multi-tenant SaaS:

The interface in C++ is as follows:

|  |
| --- |
| #ifndef SaaS\_app\_H |
| [2](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L2) | #define SaaS\_app\_H |
| [3](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L3) | class SaaS\_API; |
| [4](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L4) | #include **"SaaS\_API.h"** |
| [5](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L5) | #include **"yaml-cpp/yaml.h"** |
| [6](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L6) |  |
| [7](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L7) | class Saas\_application { |
| [8](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L8) | **public:** |
| [9](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L9) |  |
| [10](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L10) | Saas\_application(); |
| [11](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L11) |  |
| [12](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L12) | **void** print\_application\_config(); |
| [13](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L13) |  |
| [14](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L14) | **bool** get\_multi(); |
| [15](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L15) | **int** get\_mem\_intensity(**int**); |
| [16](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L16) | **int** get\_io\_intensity(**int**); |
| [17](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L17) | **int** get\_cpu\_intensity(**int**); |
| [18](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L18) | **int** get\_cache\_size(); |
| [19](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L19) |  |
| [20](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L20) | **void** set\_mem\_intensity(**int**, **int**); |
| [21](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L21) | **void** set\_io\_intensity(**int**, **int**); |
| [22](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L22) | **void** set\_cpu\_intensity(**int**, **int**); |
| [23](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L23) | **void** set\_cache\_size(**int**); |
| [24](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L24) |  |
| [25](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L25) | **int** single\_tenant\_request(); |
| [26](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L26) | **int** multi\_tenant\_request(**int**); |
| [27](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L27) |  |
| [28](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L28) | **private:** |
| [29](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L29) | std::vector<**int**> cache; |
| [30](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L30) | YAML::Node config; |
| [31](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L31) | **void** simulate(**int**, **int**, **int**); |
| [32](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L32) | **void** tenant\_lookup(**int**); |
| [33](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L33) | }; |
| [34](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L34) |  |
| [35](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.h#L35) | #endif |

The REST API is defined as follows:

|  |
| --- |
| #include **<string>** |
| [2](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L2) | #include **<iostream>** |
| [3](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L3) | #include **"SaaS\_API.h"** |
| [4](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L4) | #include **"lib/crow\_all.h"** |
| [5](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L5) | #include **"Memory\_stress.h"** |
| [6](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L6) |  |
| [7](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L7) | SaaS\_API::SaaS\_API(Saas\_application\* application): |
| [8](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L8) | application(application) |
| [9](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L9) | {} |
| [10](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L10) |  |
| [11](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L11) | // /set\_mem/id/int |
| [12](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L12) | **void** SaaS\_API::setter\_api(crow::SimpleApp& app) { |
| [13](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L13) |  |
| [14](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L14) | CROW\_ROUTE(app, "/set\_mem/<int>/<int>") |
| [15](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L15) | ([this](**int** id, **int** mem\_intensity) { |
| [16](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L16) | CROW\_LOG\_INFO << "Setting mem param: " << mem\_intensity; |
| [17](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L17) | application->set\_mem\_intensity(id, mem\_intensity); |
| [18](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L18) | **return** "mem param has been set"; |
| [19](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L19) | }); |
| [20](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L20) |  |
| [21](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L21) | CROW\_ROUTE(app, "/set\_io/<int>/<int>") |
| [22](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L22) | ([this](**int** id, **int** io\_intensity) { |
| [23](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L23) | CROW\_LOG\_INFO << "Setting io param: " << io\_intensity; |
| [24](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L24) | application->set\_io\_intensity(id, io\_intensity); |
| [25](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L25) | **return** "io param has been set"; |
| [26](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L26) | }); |
| [27](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L27) |  |
| [28](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L28) | CROW\_ROUTE(app, "/set\_cpu/<int>/<int>") |
| [29](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L29) | ([this](**int** id, **int** cpu\_intensity) { |
| [30](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L30) | CROW\_LOG\_INFO << "Setting cpu param: " << cpu\_intensity; |
| [31](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L31) | application->set\_cpu\_intensity(id, cpu\_intensity); |
| [32](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L32) | **return** "cpu param has been set"; |
| [33](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L33) | }); |
| [34](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L34) |  |
| [35](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L35) | CROW\_ROUTE(app, "/set\_cache/<int>") |
| [36](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L36) | ([this](**int** cache\_size) { |
| [37](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L37) | CROW\_LOG\_INFO << "Setting cache param: " << cache\_size; |
| [38](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L38) | application->set\_cache\_size(cache\_size); |
| [39](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L39) | **return** "cache param has been set"; |
| [40](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L40) | }); |
| [41](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L41) | } |
| [42](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L42) |  |
| [43](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L43) | **void** SaaS\_API::multitenant\_api(crow::SimpleApp& app) { |
| [44](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L44) |  |
| [45](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L45) | CROW\_ROUTE(app, "/request/<int>") |
| [46](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L46) | ([this](**int** tenant\_id) { |
| [47](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L47) | // Maybe do not allow requests for id 0, as it is used as a reserved default id |
| [48](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L48) | CROW\_LOG\_INFO << "Multitentant request for id: " << tenant\_id; |
| [49](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L49) | application->multi\_tenant\_request(tenant\_id); |
| [50](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L50) | **return** "succes"; |
| [51](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L51) | }); |
| [52](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L52) | } |
| [53](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L53) |  |
| [54](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L54) | **void** SaaS\_API::single\_api(crow::SimpleApp& app) { |
| [55](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L55) | CROW\_ROUTE(app, "/request/") |
| [56](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L56) | ([this]() { |
| [57](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L57) | CROW\_LOG\_INFO << "Single tenant request"; |
| [58](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L58) | application->single\_tenant\_request(); |
| [59](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L59) | **return** "succes \n"; |
| [60](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L60) | }); |
| [61](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L61) | } |
| [62](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L62) |  |
| [63](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L63) | **void** SaaS\_API::expose() { |
| [64](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L64) | crow::SimpleApp app; |
| [65](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L65) | crow::logger::setLogLevel(crow::LogLevel::CRITICAL); |
| [66](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L66) | setter\_api(app); |
| [67](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L67) | **if** (application->get\_multi()) { |
| [68](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L68) | multitenant\_api(app); |
| [69](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L69) | } **else** { |
| [70](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L70) | single\_api(app); |
| [71](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L71) | } |
| [72](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L72) | app.port(5000).multithreaded().run(); |
| [73](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/SaaS_API.cpp#L73) | } |

All requests are GET requests  
  
To send a message to the API you have to use a GET request, or simply type in your browser, for example the following URL, [http://](NULL)<kubeserviceip>/setmem/0/25. In linux the following command does the job wget [http://](NULL)<kubeserviceip>/setmem/0/25  
  
/setmem/0/250  means you run the application as a single tenant and you set the time intensity of the algorithm for the entire application to 25  
  
wget [http://](NULL)<kubeserviceip>/request is basically the invocation of a single request  
  
Using pyton, such request can be sent using the package [urllib](https://docs.python.org/3/library/urllib.request.html#module-urllib.request) as follows:  
  
 self.path = "/request/" + str(tenant.tenant\_id)  
 self.request\_url = ["http://"](NULL) + self.ip + ":" + self.port + self.path  
  
 try:  
            urllib.request.urlopen(self.request\_url).read()  
 except:  
            self.timeout\_count += 1  
            print("timeout + 1: " + str(self.timeout\_count))  
  
The example-controller in github already implements a Request class that uses a Java REST client to invoke the API.   
  
The semantics of the API is best described by reading the thesis. For full reference, here's the implementation of the API  
  
It distinguishes between running the application as a multi-tenant application or as a single tenant application.

|  |  |
| --- | --- |
| Saas\_application::Saas\_application() | |
| [14](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L14) | { | |
| [15](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L15) | config = YAML::LoadFile("saas\_config.yaml"); | |
| [16](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L16) |  | |
| [17](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L17) | SaaS\_API\* api = **new** SaaS\_API(this); | |
| [18](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L18) | api->expose(); | |
| [19](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L19) | } | |
| [20](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L20) |  | |
| [21](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L21) | **int** Saas\_application::single\_tenant\_request() { | |
| [22](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L22) | simulate(get\_mem\_intensity(0), get\_cpu\_intensity(0), get\_io\_intensity(0)); | |
| [23](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L23) | } | |
| [24](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L24) |  | |
| [25](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L25) | **int** Saas\_application::multi\_tenant\_request(**int** tenant\_id) { | |
| [26](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L26) | tenant\_lookup(tenant\_id); | |
| [27](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L27) | // TODO: getters op basis van id maken. | |
| [28](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L28) | simulate(get\_mem\_intensity(tenant\_id), get\_cpu\_intensity(tenant\_id),  get\_io\_intensity(tenant\_id)); | |
| [29](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L29) | } | |
| [30](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L30) |  | |
| [31](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L31) | **void** Saas\_application::tenant\_lookup(**int** tenant\_id) { | |
| [32](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L32) |  | |
| [33](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L33) | **if** (std::find(cache.begin(), cache.end(), tenant\_id) == cache.end()) { | |
| [34](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L34) | //perform I/O | |
| [35](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L35) | std::ifstream in("saas\_config.yaml"); | |
| [36](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L36) | **if** (in.is\_open()) | |
| [37](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L37) | { | |
| [38](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L38) | CROW\_LOG\_INFO << "Id not in cache"; | |
| [39](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L39) | std::**string** line; | |
| [40](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L40) | **while** ( getline(in,line) ) | |
| [41](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L41) | { | |
| [42](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L42) | **if** (line.find("multi") == 0 ){ | |
| [43](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L43) | CROW\_LOG\_INFO << "Performing I/O"; | |
| [44](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L44) | } | |
| [45](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L45) | } | |
| [46](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L46) | in.close(); | |
| [47](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L47) | } | |
| [48](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L48) |  | |
| [49](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L49) | // Add to cache | |
| [50](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L50) | **if**(cache.size() >= get\_cache\_size()) { | |
| [51](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L51) | cache.erase(cache.begin()); | |
| [52](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L52) | } | |
| [53](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L53) | cache.push\_back(tenant\_id); | |
| [54](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L54) | std::cout << cache.size() << std::endl; | |
| [55](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L55) | } | |
| [56](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L56) | } | |
| [57](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L57) |  | |
| [58](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L58) | **void** Saas\_application::simulate(**int** mem, **int** cpu, **int** io) { | |
| [59](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L59) | StressMemory\* mem\_stress = **new** StressMemory(mem); | |
| [60](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L60) | Cpu\_stress\* cpu\_stress = **new** Cpu\_stress(cpu); | |
| [61](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L61) | Io\_stress\* io\_stress = **new** Io\_stress(io); | |
| [62](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L62) |  | |
| [63](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L63) | mem\_stress->run(); | |
| [64](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L64) | cpu\_stress->run(); | |
| [65](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L65) | io\_stress->run(); | |
| [66](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L66) | mem\_stress->release(); | |
| [67](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L67) | **delete** mem\_stress; | |
| [68](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L68) | **delete** cpu\_stress; | |
| [69](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L69) | **delete** io\_stress; | |
| [70](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L70) | } | |
| [71](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L71) |  | |
| [72](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L72) | **void** Saas\_application::print\_application\_config() { | |
| [73](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L73) |  | |
| [74](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L74) | std::cout << "multitenancy: "<< get\_multi() << std::endl; | |
| [75](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L75) | std::cout << "mem\_intensity: " << get\_mem\_intensity(0) << std::endl; | |
| [76](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L76) | std::cout << "cpu\_intensity: " << get\_cpu\_intensity(0) << std::endl; | |
| [77](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L77) | std::cout << "io\_intensity: " << get\_io\_intensity(0) << std::endl; | |
| [78](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L78) |  | |
| [79](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L79) | } | |
| [80](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L80) |  | |
| [81](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L81) | **bool** Saas\_application::get\_multi() { | |
| [82](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L82) | **return** config["multi"].as<**bool**>(); | |
| [83](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L83) | } | |
| [84](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L84) |  | |
| [85](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L85) | **int** Saas\_application::get\_mem\_intensity(**int** id) { | |
| [86](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L86) | **if** (config["tenants"][id]) { | |
| [87](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L87) | **return** config["tenants"][id]["mem\_intensity"].as<**int**>(); | |
| [88](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L88) | } **else** { | |
| [89](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L89) | **return** config["mem\_intensity"].as<**int**>(); | |
| [90](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L90) | } | |
| [91](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L91) | } | |
| [92](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L92) |  | |
| [93](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L93) | **int** Saas\_application::get\_io\_intensity(**int** id) { | |
| [94](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L94) | **if** (config["tenants"][id]) { | |
| [95](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L95) | **return** config["tenants"][id]["io\_intensity"].as<**int**>(); | |
| [96](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L96) | } **else** { | |
| [97](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L97) | **return** config["io\_intensity"].as<**int**>(); | |
| [98](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L98) | } | |
| [99](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L99) | } | |
| [100](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L100) |  | |
| [101](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L101) | **int** Saas\_application::get\_cpu\_intensity(**int** id) { | |
| [102](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L102) | **if** (config["tenants"][id]) { | |
| [103](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L103) | **return** config["tenants"][id]["cpu\_intensity"].as<**int**>(); | |
| [104](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L104) | } **else** { | |
| [105](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L105) | **return** config["cpu\_intensity"].as<**int**>(); | |
| [106](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L106) | } | |
| [107](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L107) | } | |
| [108](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L108) |  | |
| [109](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L109) | **int** Saas\_application::get\_cache\_size() { | |
| [110](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L110) | **return** config["cache\_size"].as<**int**>(); | |
| [111](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L111) | } | |
| [112](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L112) |  | |
| [113](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L113) |  | |
| [114](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L114) | **void** Saas\_application::set\_mem\_intensity(**int** id, **int** mem\_int) { | |
| [115](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L115) | CROW\_LOG\_INFO << "setting mem\_intensity " << mem\_int << " for id: " << id; | |
| [116](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L116) | **if** (config["tenants"][id]) { | |
| [117](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L117) | CROW\_LOG\_DEBUG << "setting for id: " << id; | |
| [118](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L118) | config["tenants"][id]["mem\_intensity"] = mem\_int; | |
| [119](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L119) | } **else** **if** (id == 0) { | |
| [120](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L120) | CROW\_LOG\_DEBUG << "setting default"; | |
| [121](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L121) | config["mem\_intensity"] = mem\_int; | |
| [122](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L122) | } **else** { | |
| [123](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L123) | CROW\_LOG\_WARNING << "Not a valid id: " << id << ". To change the default value, use id 0"; | |
| [124](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L124) | } | |
| [125](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L125) | } | |
| [126](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L126) |  | |
| [127](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L127) | **void** Saas\_application::set\_io\_intensity(**int** id, **int** io\_int) { | |
| [128](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L128) | CROW\_LOG\_INFO << "setting io\_intensity " << io\_int << " for id: " << id; | |
| [129](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L129) | **if** (config["tenants"][id]) { | |
| [130](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L130) | config["tenants"][id]["io\_intensity"] = io\_int; | |
| [131](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L131) | } **else** **if** (id == 0) { | |
| [132](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L132) | config["io\_intensity"] = io\_int; | |
| [133](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L133) | } **else** { | |
| [134](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L134) | CROW\_LOG\_WARNING << "Not a valid id: " << id << ". To change the default value, use id 0"; | |
| [135](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L135) | } | |
| [136](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L136) | } | |
| [137](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L137) |  | |
| [138](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L138) | **void** Saas\_application::set\_cpu\_intensity(**int** id, **int** cpu\_int) { | |
| [139](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L139) | CROW\_LOG\_INFO << "setting cpu\_intensity " << cpu\_int << " for id: " << id; | |
| [140](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L140) | **if** (config["tenants"][id]) { | |
| [141](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L141) | config["tenants"][id]["cpu\_intensity"] = cpu\_int; | |
| [142](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L142) | } **else** **if** (id == 0) { | |
| [143](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L143) | config["cpu\_intensity"] = cpu\_int; | |
| [144](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L144) | } **else** { | |
| [145](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L145) | CROW\_LOG\_WARNING << "Not a valid id: " << id << ". To change the default value, use id 0"; | |
| [146](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L146) | } | |
| [147](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L147) | } | |
| [148](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L148) |  | |
| [149](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L149) | **void** Saas\_application::set\_cache\_size(**int** cache\_size) { | |
| [150](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L150) | config["cache\_size"] = cache\_size; | |
| [151](https://dnetcode.cs.kuleuven.be/projects/t16-104/repository/revisions/master/entry/app/saas/src/Saas_application.cpp#L151) | } | |