VISHNU D1.1 (TODO) - Users Management System Design

COLLABORATORS

	TITLE : VISHNU D1.1 (TODO) - Users Management System Design	

ACTION	*NAME*	*DATE*	*SIGNATURE*
WRITTEN BY	Benjamin Isnard, Daouda Traoré, Eugène Pamba Capo-Chichi, Kevin Coulomb, and Ibrahima Cissé	January 14, 2011	

REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME
0	05/01/2011	Formatting example	B.Isnard

Contents

Chapter 1

Document presentation

1.1 Document objectives

This document presents the detailed internal design of the Users Management System (UMS) module. The purpose of this module is to organize the managment of the VISHNU users.

1.2 Document structure

This document is divided into 4 parts corresponding to the main elements to describe the internal design:

- UMS architecture
- Database model
- Internal services design
- Data types description

Chapter 2

UMS Design

2.1 UMS architecture

The UMS architecture is very simple because its main activities is to write or to read information on a database. In this way, it is a simple client/server architecture where several clients can be connected to a server which make requests to the database. In this architecture, the clients can not directly request to the database because the only way to request a database is by sending a request to the server.

The communication between clients and the server in VISHNU is possible by using the middleware called Distributed Interactive Engineering Toolbox (DIET). DIET consists of a set of elements that can be used together to build applications using the Grid-RPC paradigm.

2.2 Database model

2.3 Internal services design

The description of the internal service description is organized as follows:

For each service the emphasis laid on the client and the server parts. This is an example:

UMS::service name

Client	**Server Daemon**
Client actions description	Server actions description

Pre-requisite:

- A root user have to be defined in the database
- The administrator have to defined the default value of all user options in the *table Options* of VISHNU database such as: VISHNU_CLOSE_POLICY (the way to close the session by default) and VISHNU_TIMEOUT (the default timeout uses when the CLOSE_ON_TIMEOUT value is set to VISHNU_CLOSE_POLICY).

The following paragraphs show the internal design of all services:

UMS::connect

The connect service allows the user to open a session by providing:

Required parameters:

- Login and password,

Optional parameters:

- The way for closing the session (CLOSE_ON_DISCONNECT or CLOSE_ON_TIMEOUT),

- The maximum delay in seconds when the CLOSE_ON_TIMEOUT option is set,

- For administrators, it is possible to open a session as if he/she was a specific user.

Internal client and server design:

Client	Server Daemon
Phase I required: - The size of the VISHNU user identifier is checked according to the global variables LOGIN_MIN_SIZE and LOGIN_MAX_SIZE - The size of the password is checked according to the global variables PASSWORD_MIN_SIZE and PASSWORD_MAX_SIZE. The password is encrypted by using the Secure Hash Algorithm SHA-512 of the Linux library libcrypt with a salt which is the md5 hash of the VISHNU user identifier, - The System checks the SSH key path of the user's machine define on an environment variable (VISHNU_SSHKEY_MACHINE) and get its content as a string, **Phase I optional:** - If the close policy option is set, the System checks the name of the name (CLOSE_ON_DISCONNECT or CLOSE_ON_TIMEOUT). For command line it can be set as an environment variable VISHNU_CLOSE_POLICY with the value chosen and used by default for future connect command line without connect close policy option, - If the close policy option is set to CLOSE_ON_TIMEOUT, the inactivity delay in seconds can be defined, - An administrator can be connected as if he/she was another user by providing the user VISHNU identifier. This identifier is checked according to the global variables LOGIN_MIN_SIZE and LOGIN_MAX_SIZE - All optional parameters are encapsulates on the ConnectOptions object which is serialized as a string - The System sends all previous parameters to the server **Phase III:** A sessionKey is received (for the command line it is registered on the environment variable VISHNU_SESSION_KEY)	**Phase II:** - The server checks the VISHNU user identifier and the password encrypted on the *table Users* of VISHNU database to authenticate the user. - The SSH key of the client machine is registered on the *table ClientMachine* (Base de données à compléter pour ClientMachine ...) - A new registration will be done on *the table Session*: - The sessionId is generated (how???) - The current date is registered on the dateCreation and the dateLastConnect - The sessionKey, which is an encrypted string of the current date until the microseconds (using SHA-512 with a salt as the the md5 hash of the VISHNU user identifier), is generated - The state is set to ACTIVE - The ConnectOptions object is deserialized for checking the options set - If the option close policy defined on ConnectOptions is not null, the value (CLOSE_ON_DISCONNECT or CLOSE_ON_TIMEOUT) is recorded - If the inactivity delay in seconds is set, it is recorded on *the table OptionValue* and if the close policy is CLOSE_ON_TIMEOUT, it is recorded on the *the table Session* - If the administrator option to make a connection as he/she was another user is set, the System checks that the privilege of the user on the *table Users* is ADMIN: if yes the substituteUserId is recorded as a user identifier - The userId is registered (if the substituteUserId is not already set) - The System returns the sessionKey generated to the user

UMS::reconnect

Client	Server Daemon
The connect service allows the user to open a session	Server actions description

2.4 Data types definitions

Class UMS::Command Content

Name	Type	Description
commandId	string	is the identifier of a command
sessionId	string	The sessionId is the identifier of the session define in the database
machineId	string	The machineId is the identifier of the machine used by the command
cmdDescription	string	cmdDescription is the description of the command
cmdStartTime	long	cmdStartTime is the date of the command beginning (the UNIX timestamps is used)
cmdEndTime	long	cmdEndTime is the date of the command end (the UNIX timestamps is used)

Class UMS::Configuration Content

Name	Type	Description
filePath	string	The filePath is the path of the VISHNU configuration file
listConfUsers	List of User	is the list of users objects
listConfMachines	List of Machine	is a list of machines objects
listConfLocalAccounts	List of LocalAccount	is the list of LocalAccount objects

Class UMS::ConnectOptions Content

Name	Type	Description
closePolicy	SessionCloseType	is an option for closing session automatically
sessionInactivityDelay	int	The sessionInactivityDelay is the maximum delay in seconds between two API commands when the CLOSE_ON_TIMEOUT option is set
substituteUserId	string	is an option which allows an admin to open a session as he/she was a specific user identified by his/her userId

Class UMS::ListCmdOptions Content

Name	Type	Description
AdminListOption	boolean	is an admin option for listing all commands of all users
userId	string	is an admin option for listing commands launched by a specific user identified by his/her userId
sessionId	string	lists all commands launched within a specific session
startDateOption	long	allows the user to organize the commands listed by providing the start date (the UNIX timestamp of the start date is used)
endDateOption	long	allows the user to organize the commands listed by providing the end date (the timestamp of the end date is used). By default, the end date is the current day

Class UMS::ListCommands Content

Name	Type	Description
Commands	List of Command	is the list of commands objects

Class UMS::ListLocalAccOptions Content

Name	Type	Description
AdminListOption	boolean	is an admin option for listing all local configurations of all users
userId	string	is an admin option for listing the local configurations of a specific user
machineId	string	is an option for listing local user configurations on a specific machine

Class UMS::ListLocalAccounts Content

Name	Type	Description
accounts	List of LocalAccount	is a list of LocalAccount objects which encapsulates local user configurations

Class UMS::ListMachineOptions Content

Name	Type	Description
userId	string	is an admin option for listing machines in which a specific user has a local configuration
listAllmachine	boolean	is an option for listing all VISHNU machines
machineId	string	is an option for listing information about a specific machine

Class UMS::ListMachines Content

Name	Type	Description
machines	List of Machine	is a list of machines objects which encapsulates the machines information

Class UMS::ListOptOptions Content

Name	Type	Description
AdminListOption	boolean	is an admin option for listing all user options defined in VISHNU
userId	string	is an admin option for listing the options of a specific user
optionName	string	allows the user to get the value of a specific option identified by its name

Class UMS::ListOptionsValues Content

Name	Type	Description
optionValues	List of OptionValue	is a list of optionValue objects which encapsulates the optionValue information

Class UMS::ListSessionOptions Content

Name	Type	Description
sessionListOption	SessionStateType	specifies the type of the sessions which will be listed (INACTIVE or ACTIVE)

Name	Type	Description
sessionClosePolicy	SessionCloseType	specifies the closure mode of the sessions which will be listed (CLOSE_ON_TIMEOUT or CLOSE_ON_DISCONNECT)
sessionInactivityDelay	int	specifies the inactivity delay in seconds of the sessions which will be listed
machineId	string	allows the user to list sessions opened on a specific machine
AdminListOption	boolean	is an admin option for listing all sessions of all users
userId	string	is an admin option for listing sessions opened by a specific user
sessionId	string	allows the user to list all commands launched within a specific session
startDateOption	long	allows the user to organize the commands listed by providing the start date (the UNIX timestamp of the start date is used)
endDateOption	long	allows the user to organize the commands listed by providing the end date (the timestamp of the end date is used). By default, the end date is the current day

Class UMS::ListSessions Content

Name	Type	Description
sessions	List of Session	is the list of session objects

Class UMS::ListUsers Content

Name	Type	Description
users	List of User	is the list of users objects

Class UMS::LocalAccount Content

Name	Type	Description
userId	string	The userId represents the VISHNU user identifier of the user of the local user configuration
machineId	string	The MachineId represents the identifier of the machine associated to the local user configuration
acLogin	string	accLogin represents the login of the user on the associated machine
sshKeyPath	string	sshKeyPath is the path of the ssh key of the user on the associated machine
HomeDirectory	string	HomeDirectory is the path of the home directory of the user on the associated machine

Class UMS::Machine Content

Name	Type	Description
machineId	string	represents the identifier of the machine
name	string	represents the name of the machine
site	string	represents the location of the machine
machineDescription	string	represents the description of the machine
language	string	represents the language in which the description of the machine has been done

Class UMS::OptionValue Content

Name	Type	Description
optionName	string	represents the name of an option
value	string	represents the value of an option

Class UMS::Session Content

Name	Type	Description
sessionId	string	represents the VISHNU session identifier of the session
userId	string	represents the VISHNU user identifier of the user who has opened the session
sessionKey	string	is the key of the session generated by VISHNU
dateLastConnect	long	is the date of the last connection to the session (the UNIX timestamps is used)
dateCreation	long	is the date of the first connection to the session (the UNIX timestamps is used)
dateClosure	long	is the date of the closure of the session (the UNIX timestamps is used)
state	SessionStateType	is the state of the session (ACTIVE OR INACTIVE)
closePolicy	SessionCloseType	is the way to close the session
timeout	long	is the inactivity delay in seconds associated to the CLOSE_ON_TIMEOUT option

Class UMS::UpdateUserOptions Content

Name	Type	Description
firstname	string	represents the updated firstname of the user
lastname	string	represents the updated lastname of the user
privilege	string	represents the updated privilege of the user
email	string	represents the updated email adress of the user

Class UMS::User Content

Name	Type	Description
userId	string	represents the VISHNU user identifier
password	string	is the password of the user. At the beginning, an admin can give a temporary password or it is automatically generated by the System.
firstname	string	is the firstname of the user
lastname	string	is the lastname of the user
privilege	int	is the privilege of the user (admin or simple user)
email	string	is the email of the user

Enumeration UMS::SessionCloseType Type

Name	Value
CLOSE_ON_TIMEOUT	0
CLOSE_ON_DISCONNECT	1

Enumeration UMS::SessionStateType Type

Name	Value
INACTIVE	0

Name	Value
ACTIVE	1