WeBaSeRex: Next Generation Internet Network Design using Web based Remote Execution environments

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Agenda

• Secure Sharing Scenario
• Isolated domains
• Sharing Environment: Access
• Sharing Applications
• Conclusions
Secure Sharing Scenario

User Registration Request/Response Forms

Web Server

I/O Forms

Remote Server

Comm. Server

Request/Response Forms

Input Param.

Fingerprint

Results
Secure sharing: Isolated domains

EuroNGI control

USER

Anonymous
EuroNGI User

Registration
Fingerprint

Fingerprint

EuroNGI control

Partner control

Request/Response
Forms

MainPage

Registration
Fingerprint

Web Server

Sharing Application Directory

Request/Response Forms

Comm. Server

Register

App. A - Busy RS_1*
App. B - RS_2
App. C - RS_2
App. D - Busy RS_1*
App. E - Empty None

Request App. A

RS_1

RS_2

dSA
Comm.
Server
Reg.

App. A
App. B
App. C
App. D
App. E

Request App. A

User Fingerprint

RS_2 Fingerprint

Results

RS_2 Fingerprint

RS_1

RS_2

dSA
Comm.
Server
Reg.

App. A
App. B
App. C
App. D

App. A

Anonymous
EuroNGI User

Request/Response
Forms

MainPage

Registration
Fingerprint

Web Server

Anonymous
EuroNGI User
Sharing Environment: Access

1. EuroNGI Homesite granting access

2. Sharing App. Env. validation

3. Forms based application execution requesting
Sharing Applications

Communication Manager
- Shared application indexer
- Shared environment gateway

Remote Server
- Shared application Agent

RS_1
- Busy
RS_1*
- Register

RS_2
- Busy
RS_2
- Register

App. A
- Busy
RS_1*
- Register

App. B
- RS_2

App. C
- RS_2

App. D
- Busy
RS_1*
- Register

App. E
- Empty
None

Communication Manager

Remote Server

RS_2 Fingerprint

Results

Request App. A

User Fingerprint

RS_2 Fingerprint

Communication Manager
• Shared application indexer
• Shared environment gateway

Remote Server
• Shared application Agent

RS_2 Fingerprint

Results

Request App. A

User Fingerprint

RS_2 Fingerprint

Telematic Engineering Group
University of Cantabria - SPAIN

SCC 2005
11-15 July
Sharing Applications: Examples

Demo Lab. Infrastructure:
- Remote Servers: 3 Low cost PC’s (PIII)
- Comm Server: NT server (Lab. Proxy)
- Web Server: Dept. Server

Tools
- **TSPCalc**
  The Travelling Salesman Problem
  Tool provided by partner #0

- **HITMED**
  Hierarchical Telecommunication Network Design
  Tool provided by partner #0

- **SWINET**
  Switching Network Emulator
  Tool provided by partner #0
Shared Apps: Some Methods

- “Simple/single” algorithms implementation
- DLL based applications
- Adapted applications (API definition)
HITNED

Hierarchical Telecommunication Network Design

HITNED tool implements a single CLASIG algorithm using unified traffic and distance criteria. Both heuristic and cluster solutions are particular cases in this algorithm.

Node file

Examiner...

HITNED Parameters

Number of backbone nodes
Capacity Limitation
Minimum distance between backbone nodes
Traffic threshold for backbone nodes
Capacity Limitation Mode
Epsilon (between solutions in iterations)
Number of maximum iterations

Run HITNED
SWINET

Switching Network Emulator

A network design tool for the logical layers, with proper interfaces to the MSCONAPT tool, to estimate the hierarchy, demand and link structure for each network example, and to generate the required input files from a reduced set of data file and parameters, mainly by one # file with the naming <nodename>.txt.

Data file: [Examinar...]
Config file: [Examinar...]

Run SWINET
The application is based on remote calculation modules, e.g. ring calculation algorithms. User makes the management of input files and parameters of execution and the program hand the control to the remote execution agent.

I/O interface: Coded from C, Java, CGI, html sources. Controls manage I/O application parameters

Single algorithm: TSP problem

Complete App.: CLASIG problem

Output API
Conclusions

- WeBaSeReX is a simple way for Remote executing
- Integrated Environment independently to the homesite complexity

- OBJECTIVE: To integrate different software solutions and algorithms with the lowest cost and maximum portability.
...Thank you !!!
Users & Acceses

- General user
- Partner
- Collaborator
- Administrator
General user
<table>
<thead>
<tr>
<th>URL</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td></td>
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<tr>
<td>General Links</td>
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<tr>
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<td>Tools</td>
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<td>New Tool Form</td>
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<tr>
<td>Remote Server Setup</td>
<td></td>
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<tr>
<td>Remote Server Configuration</td>
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<tr>
<td>Central Server List</td>
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<tr>
<td>Tool Information Setup</td>
<td></td>
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<tr>
<td>Partners Management</td>
<td></td>
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<tr>
<td>Users Management</td>
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</tr>
<tr>
<td>Tools Management</td>
<td></td>
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<tr>
<td>Management Control Panel</td>
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</table>
General Links

EuroNGI - Network of Excellence website

GIT - Telematics Engineering Group in University Of Cantabria, Spain

Unican - University of Cantabria, Spain
General Info

EURO-NGI’s main target is creating and maintaining the most prominent European centre of excellence in Next Generation Internet design and engineering. A specific objective of the EURO-NGI Network is the development of a Macro - Tool which provides a homogeneous environment for hosting and interrelating of the software tools developed by the research labs of the network. This paper proposes tool integration under a common user access interface as an optimal solution and proposes the Web interface as the most natural option. The paper explains several innovative aspects in the field of remote software tool execution, secure access, customized interfaces and sharing environments. WeBaSeReX is the resulting sharing environment for network planning tools based on these ideas and last sections of the paper show some concrete characteristics and application examples.

I. INTRODUCTION

The Sixth Frame and the concept of European Convergence involve the definition of collaborative environments: Excellence Networks and Integrated Projects need to interconnect the work of different laboratories, different developments and completely independent investigations. This knowledge exchange may be difficult when other factors appear: intellectual property, commercial commitments, privacy requirements, could limit this flow of information, leading to isolated developments with punctual collaborations. When software code or algorithm exchanges are impossible, only the investigations results can be interchanged. Sharing applications can make this task easier, without transgressing intellectual property for algorithms, simulation software, or source code.

This paper is organised as follows: Section II provides a definition of the application sharing concept and section III a state-of-art description for remote execution. A complete description of the WeBaSeReX proposal appears in Section IV. Finally Section V and VI introduce some concepts about adaptation of tools and its integration into the shared applications environment.

II. Applications Sharing
Communications

Documental Service

Deliverables: coming soon

Audio / video

Download Skype

Contact Alberto E. García: username aegarcia

Contact Roberto Ortiz: username roberto_ortiz

Next insertions

Forum, etc. Coming soon.
Tools

+ TSPCalc
The Travelling Salesman Problem
Tool provided by partner #0

+ HITNED
Hierarchical Telecommunication Network Design
Tool provided by partner #0

+ SWINET
Switching Network Emulator
Tool provided by partner #0

Tools Management
<table>
<thead>
<tr>
<th>Application name:</th>
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<tbody>
<tr>
<td>Owner:</td>
<td></td>
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<tr>
<td>Partner Number:</td>
<td></td>
</tr>
<tr>
<td>Contact Name:</td>
<td></td>
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<tr>
<td>Contact e-mail:</td>
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<tr>
<td>Description:</td>
<td></td>
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<td>Windows</td>
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<td>Source Code:</td>
<td>C++</td>
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<tr>
<td>Application Type:</td>
<td>Command</td>
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<td>Name of executable file:</td>
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<tr>
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<td></td>
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<tr>
<td>Number of input files:</td>
<td>2</td>
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<tr>
<td>Number of output files:</td>
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Collaborator

General Links

General Info

Communications

Tools

Tools Management

Management Control Panel
REMOTE SERVER IS ACTIVE!!
REMOTE SERVERS AVAILABLE:

tpcalc 192.168.0.2 1322

tpcalc 192.168.0.2 1234

clasigcons 192.168.0.2 1235

swinet 192.168.0.2 1236
General Links

General Info

Communications

Tools

Tools Management

Management Control Panel
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<td><strong>Users Management</strong></td>
</tr>
<tr>
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</table>
Add Partner

Name

Contact

Info

Category
user

Submit
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TSPCalc

The Travelling Salesman Problem

Nodes file: [Input Field] Examinar...

Data file: [Input Field] Examinar...

Config file: [Input Field] Examinar...

Run TSPCalc
HITNED

Hierarchical Telecommunication Network Design

HITNED tool implements a single CLASIC algorithm using unified traffic and distance criteria. Both heuristic and cluster solutions are particular cases in this algorithm.

Node file

Examiner...

HITNED Parameters

Number of backbone nodes
Capacity Limitation
Minimum distance between backbone nodes
Traffic threshold for backbone nodes
Capacity Limitation Mode
Epsilon (between solutions in iterations)
Number of maximum iterations

Run HITNED
Results files:

+ S47_link.dat
+ S47_Conpat_Heuristic_nodos.txt
+ S47_Conpat_Heuristic_link.txt
+ path.txt

Advanced execution

Input file: [Examiner...]
Result files:
S47_Link.dat [link]
S47_Conpat_Heuristic_nodos.txt [heuristic nodes]
S47_Conpat_Heuristic_link.txt [heuristic link]
path.txt [path]

Parameters

- parameter #1
- parameter #2 [s47.dat]
- parameter #3 [4]
- parameter #4 [0]
- parameter #5 (optional)
- parameter #6 (optional)
- parameter #7 (optional)
- parameter #8 (optional)
- parameter #9 (optional)
- parameter #10 (optional)
- parameter #11 (optional)
- parameter #12 (optional)
- parameter #13 (optional)
- parameter #14 (optional)