

# *Patterns of Sustained Collaborative Creativity Across Open Computerization Movements*

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# Overview

- Three emerging Computerization Movements
  - Open source software, computer games, and scientific grid computing
  - CM intersections
    - OSS-CG, OSS-SGC, CG-SGC, OSS-CG-SGC
- Observations and discussion

# Computerization movements

- *Social movement theory*: Blumer, Zald, Gerlach
- *CM studies*: Kling and Iacono, Elliott and Scacchi
- *Computing world dynamics*: Kling and Gerson, Scacchi
- *Socio-technical interaction networks*: Kling, McKim, Lamb, Sawyer, Scacchi, et al.

# Three emerging CMs

- Open source software
- Computer games
- Scientific grid computing  
(*Cyberinfrastructure*)

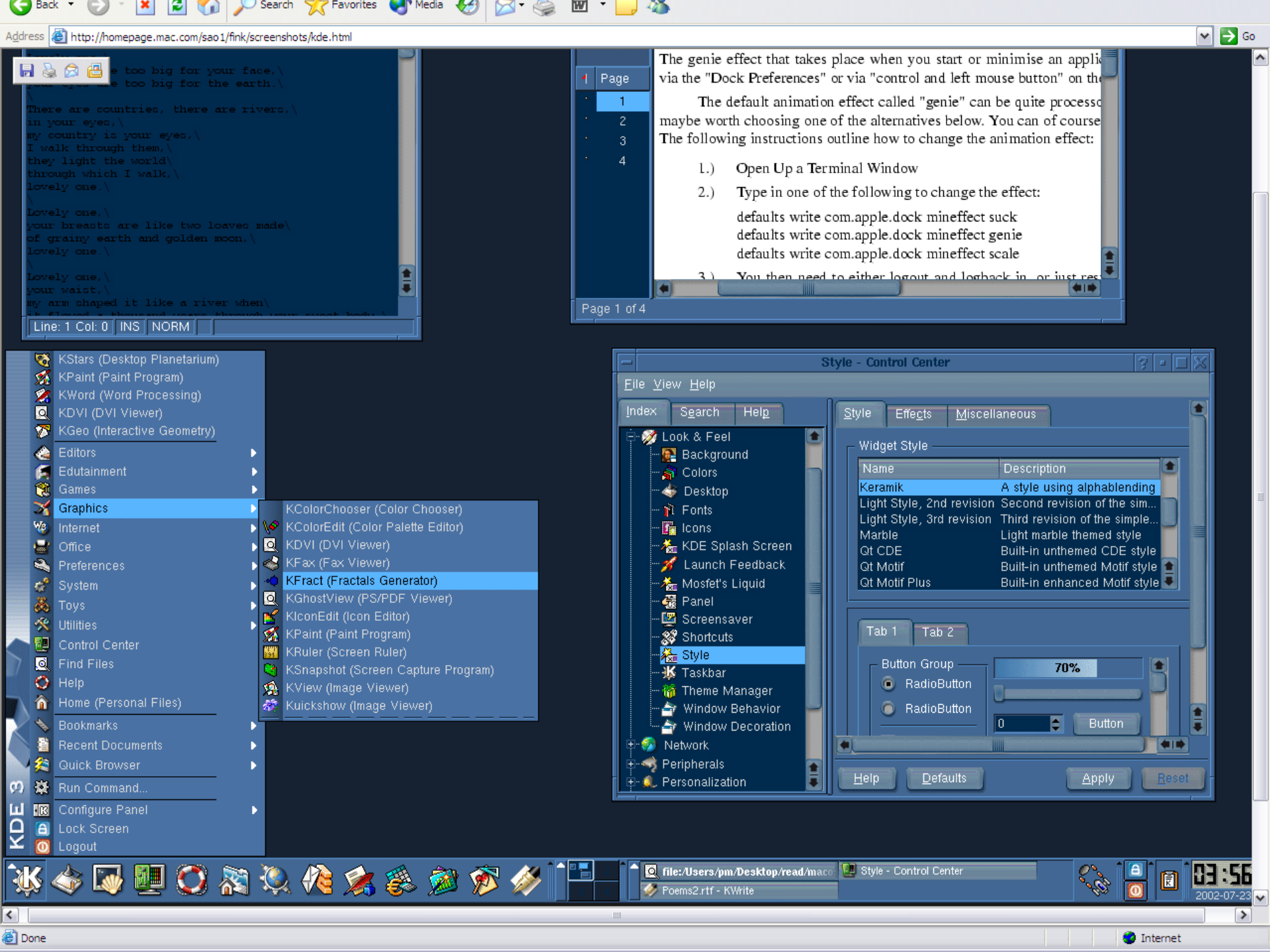
# CM drivers

- Structural patterns
- Participants beliefs in action
- Organizational centers
- Collaborative work practices within *innovation processes* that intersect or segment one another
  - *Innovations* add to, or redistribute access to, computing or workplace resources
  - Innovation processes *animate* and *provide emergent force* to computerization movements

# Routine innovation processes as collaborative creativity

- *Development*--inventing and discovering, reinventing, and standardizing software development
- *Use*--acquiring software systems and skills, while also tailoring of software system features to support software system use
- *Maintenance*--debugging, enhancing, restructuring (refactoring), tuning, or migrating to new versions of software systems being actively maintained

# Open Source Software



```
There are countries, there are rivers,\nin your eyes,\nmy country is your eyes,\nI walk through them,\nthey light the world,\nthrough which I walk,\nlovely one.\n\nLovely one,\nyour breasts are like two loaves made\nof grainy earth and golden moon,\nlovely one.\n\nLovely one,\nyour waist,\nmy arm shaped it like a river when\nit flowed a thousand years through your great body.
```

Line: 1 Col: 0 INS NORM

#### Page

- 1
- 2
- 3
- 4

The genie effect that takes place when you start or minimise an application via the "Dock Preferences" or via "control and left mouse button" on the

The default animation effect called "genie" can be quite processive maybe worth choosing one of the alternatives below. You can of course The following instructions outline how to change the animation effect:

- 1.) Open Up a Terminal Window
- 2.) Type in one of the following to change the effect:  
defaults write com.apple.dock mineffect suck  
defaults write com.apple.dock mineffect genie  
defaults write com.apple.dock mineffect scale
- 3.) You then need to either logout and logback in, or just res

KStars (Desktop Planetarium)  
KPaint (Paint Program)  
KWord (Word Processing)  
KDVI (DVI Viewer)  
KGeo (Interactive Geometry)

Editors  
Edutainment  
Games

Graphics

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Home (Personal Files)  
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Quick Browser  
Run Command...

Configure Panel  
Lock Screen  
Logout

KColorChooser (Color Chooser)  
KColorEdit (Color Palette Editor)  
KDVI (DVI Viewer)  
KFax (Fax Viewer)  
KFract (Fractals Generator)  
KGhostView (PS/PDF Viewer)  
KIconEdit (Icon Editor)  
KPaint (Paint Program)  
KRuler (Screen Ruler)  
KSnapshot (Screen Capture Program)  
KView (Image Viewer)  
Kuickshow (Image Viewer)

#### Style - Control Center

File View Help

Index

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Help

Look & Feel  
Background  
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KDE Splash Screen  
Launch Feedback  
Mosfet's Liquid  
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Shortcuts  
Style  
Taskbar  
Theme Manager  
Window Behavior  
Window Decoration  
Network  
Peripherals  
Personalization

Style

Effects

Miscellaneous

#### Widget Style

Name	Description
Keramik	A style using alphablending
Light Style, 2nd revision	Second revision of the sim...
Light Style, 3rd revision	Third revision of the simple...
Marble	Light marble themed style
Qt CDE	Built-in unthemed CDE style
Qt Motif	Built-in unthemed Motif style
Qt Motif Plus	Built-in enhanced Motif style

Tab 1

Tab 2

Button Group

70%

☐ RadioButton

☐ RadioButton

0

Button

Help

Defaults

Apply

Reset

file:/Users/pm/Desktop/read/maco

Style - Control Center

Poems2.rtf - KWrite

03:56

2002-07-23



WHEN YOU PROGRAM OPEN SOURCE,  
YOU'RE PROGRAMMING  
**COMMUNISM**



A REMINDER  
*from*  
YOUR FRIENDS AT MICROSOFT

**SourceForge.net**

Create, Participate, Evaluate

Project of the Month

Stellarium

SourceForge.net Changes

What's changed and will change next

Registered Projects: 119,351 Registered Users: 1,315,763

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## Project News

RSS

**Stellarium 0.8.0 released**

05/03/06 05:19 - Stellarium

Stellarium, a desktop planetarium for your computer, reaches version 0.8.0. It is the result of 7 months of active development of the developers team.

[Read More »](#)**ClamWin Free Antivirus 0.88.1 released** 04/07/06 07:34**Portable FileZilla 2.2.19a Released** 04/07/06 07:34**IMP render farm 0.65 released** 04/07/06 07:33[Project news archive »](#)

## Software Categories

+ Clustering

+ Database

+ Desktop

+ Development

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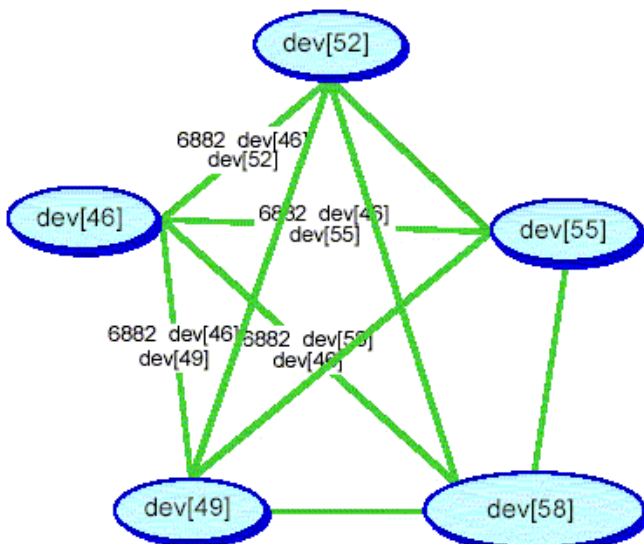




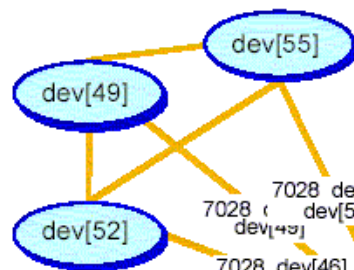
# OSS Developer - Social Network

Developers are nodes / Projects are links  
 24 Developers  
 5 Projects  
 2 Linchpin Developers  
 1 Cluster

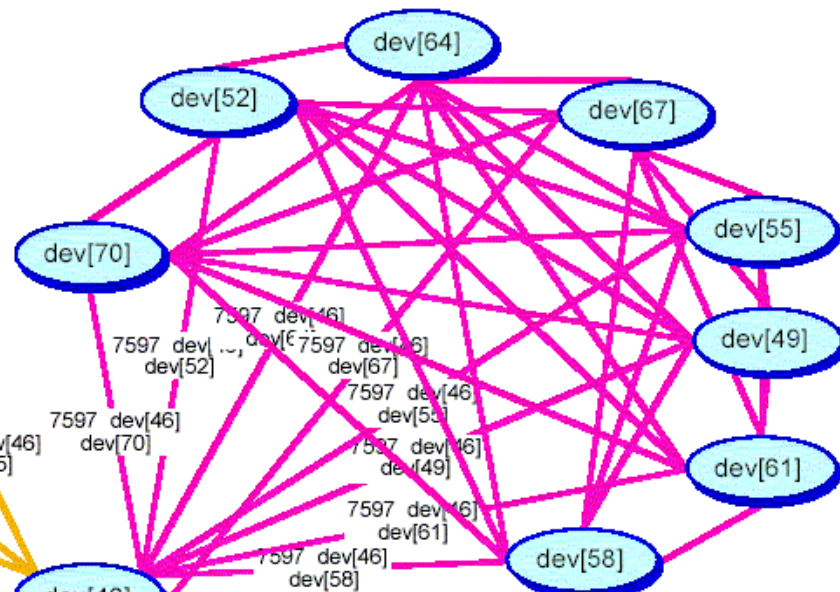
Project 6882



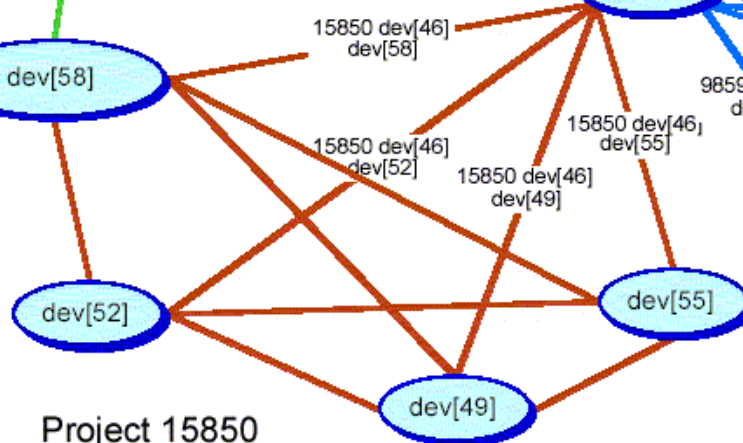
Project 7028



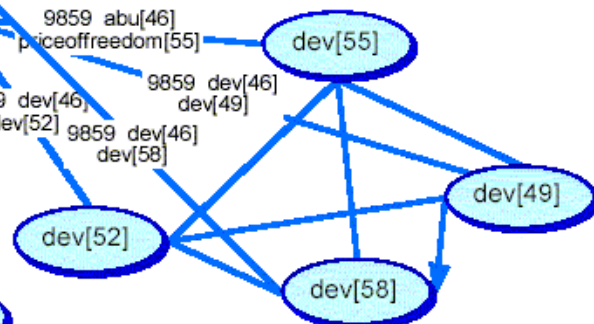
Project 7597



Project 15850



Project 9859





## Google Code

[Google Code Home](#) > Summer of Code

# Summer of Code

Welcome to the Summer of Code 2006 site. We are no longer accepting applications from students or mentoring organizations. Students can view previously submitted applications and respond to mentor comments via the [student home page](#). Accepted student projects will be announced on [code.google.com/soc/](http://code.google.com/soc/) on May 23, 2006. You can talk to us in the [Summer-Discuss-2006 group](#) or via IRC in #summer-discuss on [SlashNET](#).

If you're feeling nostalgic, you can still access the [Summer of Code 2005](#) site.

## Participating Mentoring Organizations

<a href="#">AbiSource</a> ( <a href="#">ideas</a> )	<a href="#">Monotone</a> ( <a href="#">ideas</a> )
<a href="#">Adium</a> ( <a href="#">ideas</a> )	<a href="#">Moodle</a> ( <a href="#">ideas</a> )
<a href="#">Apache Software Foundation</a> ( <a href="#">ideas</a> )	<a href="#">MythTV</a> ( <a href="#">ideas</a> )
<a href="#">Ardour</a> ( <a href="#">ideas</a> )	<a href="#">NetBSD</a> ( <a href="#">ideas</a> )
<a href="#">ArgoUML</a> ( <a href="#">ideas</a> )	<a href="#">Nmap Security Scanner</a> ( <a href="#">ideas</a> )
<a href="#">BBC Research</a> ( <a href="#">ideas</a> )	<a href="#">OGRE</a> ( <a href="#">ideas</a> )
<a href="#">Beagle</a> ( <a href="#">ideas</a> )	<a href="#">OhioLINK</a> ( <a href="#">ideas</a> )
<a href="#">Blender</a> ( <a href="#">ideas</a> )	<a href="#">One Laptop Per Child</a> ( <a href="#">ideas</a> )
<a href="#">Boost</a> ( <a href="#">ideas</a> )	<a href="#">Open Security Foundation (OSVDB)</a> ( <a href="#">ideas</a> )
<a href="#">Bricolage</a> ( <a href="#">ideas</a> )	<a href="#">Open Source Applications Foundation</a> ( <a href="#">ideas</a> )
<a href="#">ClamAV</a> ( <a href="#">ideas</a> )	<a href="#">Open Source Cluster Application Resources (OSCAR)</a> ( <a href="#">ideas</a> )
<a href="#">Cockos Incorporated</a> ( <a href="#">ideas</a> )	<a href="#">Open Source Development Labs (OSDL)</a> ( <a href="#">ideas</a> )
<a href="#">Codehaus</a> ( <a href="#">ideas</a> )	<a href="#">OpenOffice.org</a> ( <a href="#">ideas</a> )
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<a href="#">Crystal Space</a> ( <a href="#">ideas</a> )	<a href="#">Oregon State University Open Source Lab (OSL)</a> ( <a href="#">ideas</a> )
<a href="#">CUWiN Wireless Project</a> ( <a href="#">ideas</a> )	<a href="#">PHP</a> ( <a href="#">ideas</a> )
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<a href="#">Debian</a> ( <a href="#">ideas</a> )	<a href="#">Plone Foundation</a> ( <a href="#">ideas</a> )
<a href="#">Detached Solutions</a> ( <a href="#">ideas</a> )	<a href="#">Portland State University</a> ( <a href="#">ideas</a> )
<a href="#">Django (Lawrence Journal-World)</a> ( <a href="#">ideas</a> )	<a href="#">PostgreSQL Project</a> ( <a href="#">ideas</a> )
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<a href="#">Drupal</a> ( <a href="#">ideas</a> )	<a href="#">Python Software Foundation</a> ( <a href="#">ideas</a> )
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	<a href="#">Refractions Research</a> ( <a href="#">ideas</a> )

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[Organizations](#)

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[Student FAQ](#)

[Mentor FAQ](#)

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[Data APIs](#)

[Desktop SDK](#)

[Earth \(KML\)](#)

[Enterprise APIs](#)

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[Maps API](#)

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[Talk \(XMPP\)](#)

[Toolbar API](#)

[Web Search API](#)

## Open Source Projects

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[Coredumper](#)

[Goopy](#)

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# Computer Games





[unrealtournament.com](http://unrealtournament.com)



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### Welcome to CSPORTS.net

#### Worldwide Rankings and Stats

Welcome to the most comprehensive ranking and stats system in the world for online gamers. From Half Life to Battlefield:Vietnam, CSports.net tracks the performance of individuals, clans and games providing definitive worldwide rankings. To find out how good you are just use the quicksearch tool at the top of the menu.

#### Optimal Online Gaming

We provide a suite of tools to help you get more from your online gaming. Rank freezing, buddy tracking, a customisable home page, ranking banners and much more. Do you preform better then your buddies ? Find players and where they play and much more. Check out the features below.

### CSPORTS.net News

[Csports.net Exclusive: T0-Crossfire Interview](#)
[Csports.net Inside: {GC}TaTonga](#)
[Csports.net partner organises online tournament](#)
[Official website for Urban Chaos: Riot Responce launched](#)
[Playing Quake III on 24 screens](#)
[Most Slots: Battlefield holds the crown!](#)
[Diary from Iraq: Part 1](#)
[Pandora Studios Interview](#)

### CSPORTS.net Stats

All-time Player Names	625,564,007
Active Players	22,547,342
Player Hours Today	2,655,571
Players Online Now	131,407
Servers Online Now	102,784
Modifications Recorded	3,259
Maps Recorded	726,140
Registered Members	183,606

### What's on CSPORTS.net





The Unreal Engine  
Documentation Site

Wiki Community  
Topic Categories  
Image Uploads  
Random Page  
Recent Changes  
Offline Wiki

Unreal Engine  
Console Commands  
Terminology  
FAQs  
Help Desk

Mapping Topics  
Mapping Lessons  
UnrealEd Interface

UnrealScript Topics  
UnrealScript Lessons  
Making Mods  
Class Tree

Modeling Topics

Chongqing Page  
Log In

## The Layman's Guide to Making Mods

If you are thinking about making a mod (for any game) and are not sure what you need to know, how to go about it, or simply want to avoid the most obvious mistakes then read on. The pages linked to below contain some excellent advice, and possibly comments on stuff that hadn't occurred to you.

- [/My Team Your Team](#) – Introduction and disclaimer for all those, "what's all this my team your team crap?" readers.
- [/Why Are You Making A Mod](#) – Sometimes the reason a mod fails is the reason you started it in the first place.
- [/Building a Team](#) – Building up your mod team.
- [/Despotism Or Communism](#) – Some thoughts on team structure.
- [/Working as a Team](#) – The day to day life of a team.
- [/Asset Management](#) – How to manage the assets of your mod (code, textures, models, etc).
- [/Distributed Development](#) – Find out how hard and unpleasant distributed development can be.
- [/Effective Testing](#) – How to get the most out of testing your mod.
- [Releasing A Mod](#)
- [/Supporting Your Mod](#) – Easing the burden of mod support.
- [/Mod Death](#) – What happens when a mod or mod team self destruct and how to cope.

## Thoughts on Mod Making

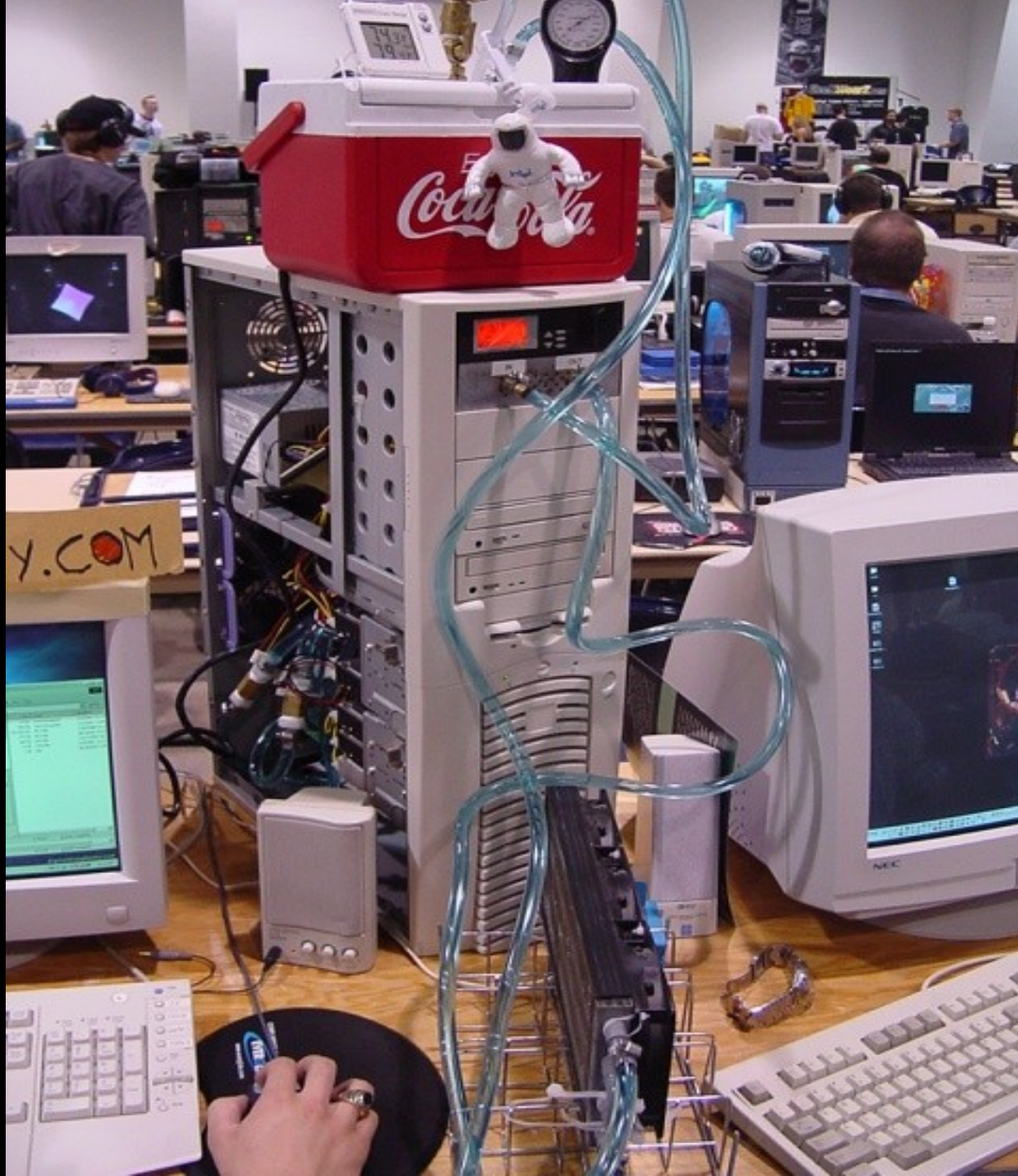
Several of the Unreal Wiki's contributors have experience in creating successful mods. Reading their accounts of their work and their advice is recommended.

- [Mychaeel/Mod Startups](#) – Making your idea a reality.
- [Mychaeel/Modding Etiquette](#) – How to make people like your mod.
- [Jb](#) – an analysis of the ChaosUT mod's history
- [Piglet/Finishing Things](#) – How to actually finish your mods, that said it's more how to **start** so that you **can** finish.
- [A Bug's Life](#)
- [GODZ Inception](#) – a journal of how GODZ started.
- [Making Mods/General Mod Optimization](#) – Common mistakes and ignored settings which often lead to lower performance – and how to fix/use them.

















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*Watch Movies*

## The French Democracy



A film by [koulamata](#)



*Click here to play...*



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### Featuring

**Randolph d'Amore - Director**



**Mohamed Relou - Second Supporting Role**



### About

This is a movie about the recent French riots in suburb. It is fully subtitled in english(sorry for my english, i had some training to do). I hope you will enjoy this movies and have a better understand of what is happening in my country!

# Scientific Grid Computing (Cyberinfrastructure)





# National Science Foundation

OFFICE OF  
Cyberinfrastructure

SEARCH

NSF Web Site



OCI Home

OCI Funding

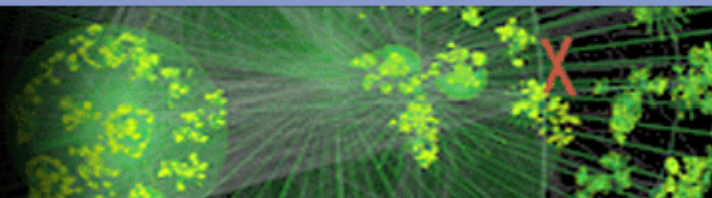
OCI Awards

OCI Discoveries

OCI News

About OCI

Cyberinfrastructure - stimulating  
advances in 21st century  
science and engineering



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## Special Announcements

### • Petascale Acquisition Forum, Mar 24, '06

NSF Invites Prospective Proposing Institutions and Vendors to a Discussion of Plans for a Petascale HPC Acquisition

As indicated in the President's FY 2007 Budget Request, NSF is planning for the acquisition of a petascale high-performance computing (HPC) system. Subject to the availability of funds, NSF expects to begin funding the resulting multi-year acquisition project in FY07. The petascale HPC system to be acquired will permit science and engineering communities to address some of their most computationally challenging research needs.

HPC system vendors and potential resource provider organizations (organizations who, either separately or in collaboration with others, wish to propose to manage the development, deployment, and operation of a petascale system on behalf of the science and engineering research community) are invited to meet with each other and with NSF staff to discuss the time-line and strategy for this petascale system acquisition on Friday, March 24, 2006, from 9:00a.m. - 11:00a.m., at the National Science Foundation, 4201 Wilson Blvd., Arlington, VA, 22230. Those interested in attending this meeting should send email with their name and affiliation to HPC-Input@nsf.gov, no later than March, 20, 2006. Space is limited so please register early.

## Quick Links

[Reports and Workshops Relating to Cyberinfrastructure and Its Impacts](#)
[Publications](#) [See All](#)
[Report of Blue-Ribbon Advisory Panel on Cyberinfrastructure](#)

## Other Site Features

[Special Reports](#)
[Research Overviews](#)
[Multimedia Gallery](#)
[Classroom Resources](#)
[NSF-Wide Investments](#)

- ATLAS Experiment for the Large Hadron Collider, <http://atlasexperiment.org/>.
- Chemical & Engineering News editorial, <http://pubs.acs.org/cen/editor/83/8311edit.html>
- Chemistry Division Cyber-Enabled Chemistry Workshop held 3-5, 2004, [http://bioeng.berkeley.edu/faculty/cyber\\_workshop/](http://bioeng.berkeley.edu/faculty/cyber_workshop/)
- CHEPREO, <http://www.chepreo.org/>.
- Computation as a Tool for Discovery in Physics, report by the Steering Committee on Computational Physics <http://www.nsf.gov/pubs/2002/nsf02176/nsf02176.pdf>.
- Data Intensive Science University Network (DISUN), <http://www.disun.org/>.
- Folding@Home, <http://folding.stanford.edu/>.
- GridChem, <https://www.gridchem.org/>.
- ITR:Computational Science and Engineering Online (CSEO), <http://www.cseo.net> ITR: Grid Physics Network (GriPhyN), <http://www.griphyn.org/>.
- Identifying Major Scientific Challenges in the Mathematical and Physical Sciences and their CyberInfrastructure and Their CyberInfrastructure Needs: A workshop funded by the National Science Foundation Held on April 21, 2004, <http://www.nsf.gov/attachments/100811/public/CyberscienceFinal4.pdf>.
- International Virtual Data Grid Laboratory (iVDGL), <http://www.ivdgl.org/>.
- Mass Spectrometry: Remote Experimentation and Collaboration, <http://www.udel.edu/topics/internet2/proj/maldi/>.
- Materials Research Cyberscience enabled by Cyberinfrastructure Workshop held June 17 - 19, 2004, <http://www.nsf.gov/mps/dmr/csci.pdf>
- Mixed Apparatus for Radio Investigation of Atmospheric Cosmic Ray of High Ionization (MARIACHI), <http://www-mariachi.physics.sunysb.edu/>.
- National Virtual Observatory, <http://www.us-vo.org/>.
- Open Science Grid (OSG), <http://www.opensciencegrid.org/>.
- QuarkNet for Educators, <http://quarknet.fnal.gov/>.
- UltraLight, <http://www.ultralight.org/>.
- Worldwide Large Hadron Collider (LHC) Computing Grid, <http://lcg.web.cern.ch/LCG/>.





# Open Science Grid

## OSG Home

## About OSG

[News and Media](#)  
[How to Participate](#)  
[Activities](#)  
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## Using OSG

[Production Grid](#)  
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[User AUP](#)

## Grid Support

[Users](#)  
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[Support Centers](#)  
[VOs](#)

## Welcome

The Open Science Grid is a US grid computing infrastructure that supports scientific computing via an open collaboration of science researchers, software developers and computing, storage and network providers.

The OSG Consortium builds and operates the OSG, bringing resources and researchers from universities and national laboratories together and cooperating with other national and international infrastructures to give scientists from many fields access to shared resources worldwide.



*Credits, clockwise from top left: ATLAS Collaboration; LIGO Laboratory; SDSS Collaboration; copyright CERN; Fermilab; STAR Collaboration*

## Latest News

[ISGC 2006](#) May 1 - 4, 2006.

View presentations:

- [OSG One Grid one grid among many](#)
- [OSG and its Interoperation with the EGEE](#)
- [Service-Oriented Science: Scaling eScience Impact](#)
- [CMS Plans & Strategy for Physics Analysis on the Grid](#)
- [CMS Computing Using the Worldwide LHC Computing Grids](#)

The 5th Annual PKI R&D Workshop took place April 4-6, 2006. View presentations by [Doug Olson](#) and [Michael Helm](#).

[Paul Avery's Presentation](#) at the

# Intersecting CMs

## OSS and Computer Games

- If developing software is rewarding, and playing games is fun, then developing game software should be fun and rewarding.
- Game *modding* is a primary venue for innovative OSS game development
- Game *mods* sell games, and help their developers get jobs in the game industry.
- --> Likely to persist as a shared segment of both the OSS and Computer Game worlds



## Software Map Topics

Welcome to the Software Map. The Software map will help you quickly navigate around the thousands of projects hosted on SourceForge.net. To use the Software Map, simply click on one of the popular Topics displayed. Once you're browsing a particular topic, you'll be able to easily filter, sort and search your project list.

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Most downloaded: [openMosix](#)  
Most active: [openQRM](#)

### Database (5475)

Most downloaded: [Tux Racer](#)  
Most active: [KeePass](#)  
[Password Safe](#)

### Desktop (2856)

Most downloaded: [GnuWin32](#)  
Most active: [KeePass](#)  
[Password Safe](#)

### Development (18974)

Most downloaded: [Dev-C++](#)  
Most active: [ZK - Ajax but no JavaScript](#)

### Enterprise (884)

Most downloaded: [Compiere](#)  
[ERP + CRM Business Solution](#)  
Most active: [JasperReports](#)

### Financial (1575)

Most downloaded: [vtiger CRM](#)  
Most active: [jproject-open](#)

### Games (12903)

Most downloaded: [ZSNES](#)  
Most active: [G3D - 3D Engine](#)

### Hardware (1512)

Most downloaded: [Tcl](#)  
Most active: [Tcl](#)

### Multimedia (11710)

Most downloaded:  
[Weka--Machine Learning](#)  
[Software in Java](#)  
Most active: [ZK - Ajax but no JavaScript](#)

### Networking (4058)

Most downloaded: [FileZilla](#)  
Most active: [Asterisk@Home](#)

### Security (2526)

Most downloaded: [Eraser](#)  
Most active: [KeePass](#)  
[Password Safe](#)

### SysAdmin (2955)

Most downloaded: [TightVNC](#)  
Most active: [phpMyAdmin](#)

### VoIP (246)

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# Intersecting CMs

## OSS and Scientific Grid Computing

- *Globus*, the key middleware component for SGC, is OSS
- GC depends on:
  - Open grid service integration (OGSI)
  - Open grid service architecture (OGSA)
  - Globus standardization and open source
  - To enable innovative configuration and integration of virtual organizations from their open application service interfaces
- --> Likely to be assimilated within Scientific Grid Computing world

## Welcome to the Globus Toolkit Homepage

The Globus Toolkit ® is an open source software toolkit used for building grids. It is being developed by the Globus Alliance and many others all over the world. A growing number of projects and companies are using the Globus Toolkit to unlock the potential of grids for their cause. [Learn more...](#)

### Globus Toolkit Headlines ([Archive](#), [Events](#))

- 05.11.2006 **Globus used in avian flu research** [Learn more...](#)
- 05.11.2006 **PHENIX Data Fly With GridFTP** [Learn more...](#)
- 04.19.2006 **GT 4.0.2 is now available for download** [Learn more...](#)
- 04.18.2006 **GlobusWORLD 2006 call for participation is available** [Learn more...](#)
- 04.17.2006 **Puerto Rican University Deploys Grid Testbed** [Learn more...](#)

[XML](#) What's this?

#### About the Globus Toolkit

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#### Who's Involved

- [Globus Toolkit Team](#)

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#### Globus Toolkit Technology Pages

- [Common Runtime Components](#)
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# Intersecting CMs

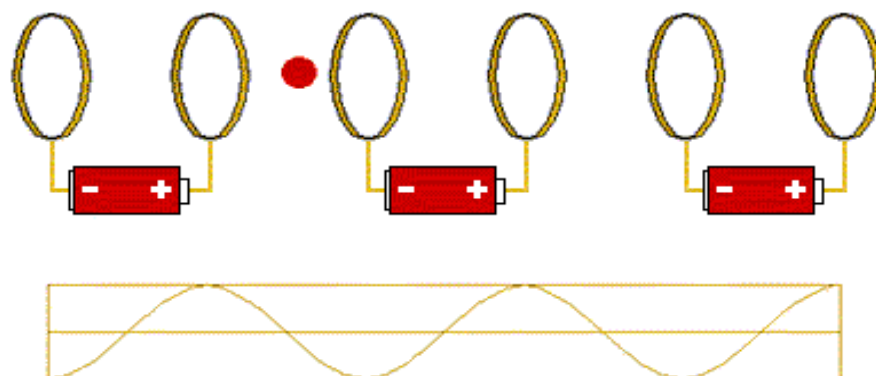
## **Computer Games and Cyberinfrastructure**

- Game grids for massively multiplayer online games (MMOG)
- New Sony PlayStation 3 (Fall 2006) to utilize grid services
- Enables new class of innovative game play experiences and virtual (game-based) economies (i.e., games + EBay) for game developers to create
- Represents new, innovative venue for government R&D (and Education) investments
- --> Likely to be assimilated into Computer Game world



## TOOLS

## Accelerate the Particle

[PLAY GAME](#)

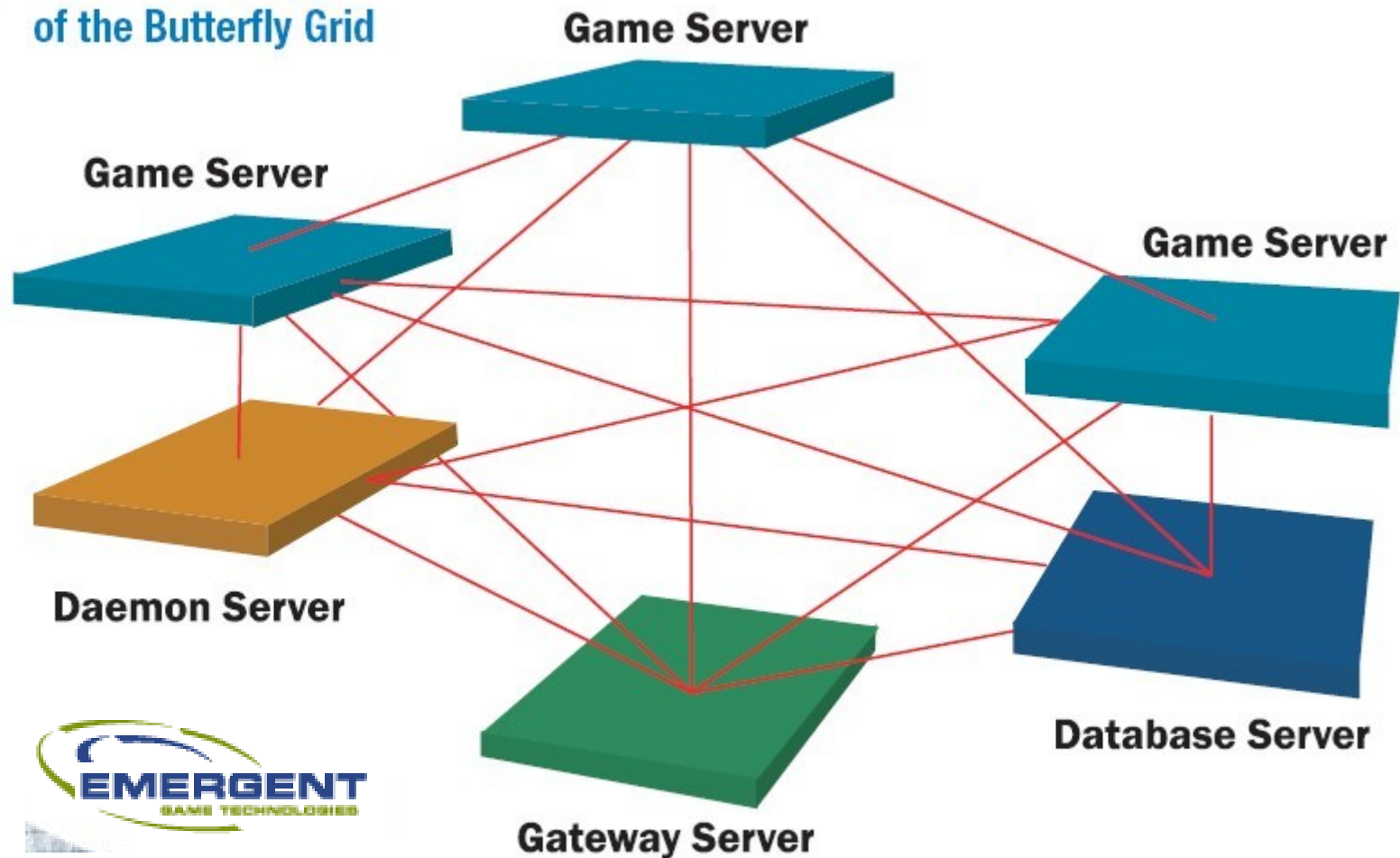
(may take a few moments to load)

game created by CERN

## THE HEART OF THE MATTER

Research at CERN that garnered a Nobel Prize in 1984: Carlo Rubbia and Simon Van der Meer for the discovery of the "W and Z particles, communicators of the weak interaction."

## Fully-Meshed Architecture of the Butterfly Grid



# Intersecting CMs

## **OSS, Computer Games, Cyberinfrastructure**

- Smallest, least-populated sub-world
- Linking three independent CMs/subworlds
- Very few projects, modest social network, unable to instigate network externalities
- Denotes an interesting “boundary case”, as is potential to stimulate or support innovative apps
  - > May be the social locale giving rise to the *Web 3.0*





# Observations

- Prior studies treated CMs as independent, rather than segmented, polycentric, networked, heterogeneous, and intersecting
- Some intersecting CMs are assimilated into the larger/dominant CM
- Other intersecting CMs have the potential to emerge as their own sub-world
- Other intersections may be so fragile and marginal as to merit study on their own.

# Observations

- How open a CM is determined by the *innovation frontier* it supports or creates
- The recurring emergence of creative collaborative work is inherent when CMs intersect one another.

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