



Proyecto Golem: Replanteando la nube

BLOCK  **MAD**



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INTRODUCCION: ¿QUÉ ES GOLEM?

The logo for Golem, featuring the word "golem" in a white, lowercase, sans-serif font on a black square background. The letter 'g' is stylized with a small circle above it.

**Computing Power.
Shared**

- Golem es un sistema de computación distribuida y compartida.
- Permite crear un Market Place, donde puedes ofrecer o comprar tiempo de cálculo.
- Por ahora hay un número limitado de aplicaciones en las que se puede usar.
- Pero apenas está empezando y ¡hay planes muy interesantes!

INTRODUCCION: COMPUTACIÓN DISTRIBUIDA

ORIGENES:

- PROYECTO SETI

OTROS PROYECTOS:

- ETHEREUM: SWARM...
- SUBUTAI: <https://optdyn.com>
- Bitcoin SV
- ...

INTRODUCCION: CONCEPTOS BASICOS

WORLDWIDE SUPERCOMPUTER:

Golem is the first truly decentralized, global market for computing power.

Combined with flexible tools to aid developers in distributing and monetizing their software, Golem altogether changes the way compute-intensive tasks are both organized and executed.

Golem is set to become one of the key building blocks of future Internet by providing a platform for decentralized microservices.

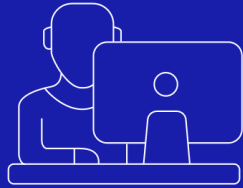
And, by substantially lowering the price of computations, complex applications such as CGI rendering, scientific calculation, and machine learning become more accessible to everyone.

INTRODUCCION: CONCEPTOS BASICOS

- Golem is a decentralized marketplace for computing power. It enables CPUs and GPUs to connect in a peer-to-peer network, enabling both application owners and individual users ("requestors") to rent resources from other users' ("providers") machines.
- These resources can be used to complete tasks requiring any amount of computation time and capacity. Nowadays, centralized cloud providers are in control of these services, these platforms are constrained by closed networks, proprietary payment systems, and hard-coded provisioning operations.
- Golem proposes an open-source, decentralized and user controlled alternative.
- One core component to Golem's built-in feature set is an Ethereum-based transaction system, which enables direct payments between requestors, providers, and software developers.

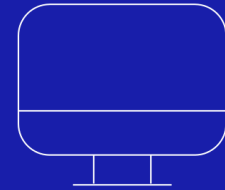
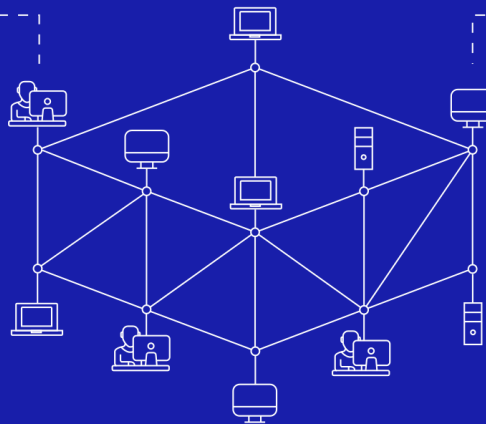
INTRODUCCION: ROLES EN GOLEM

golem Computing Power.
Shared



REQUESTOR
of computing resources
market supply

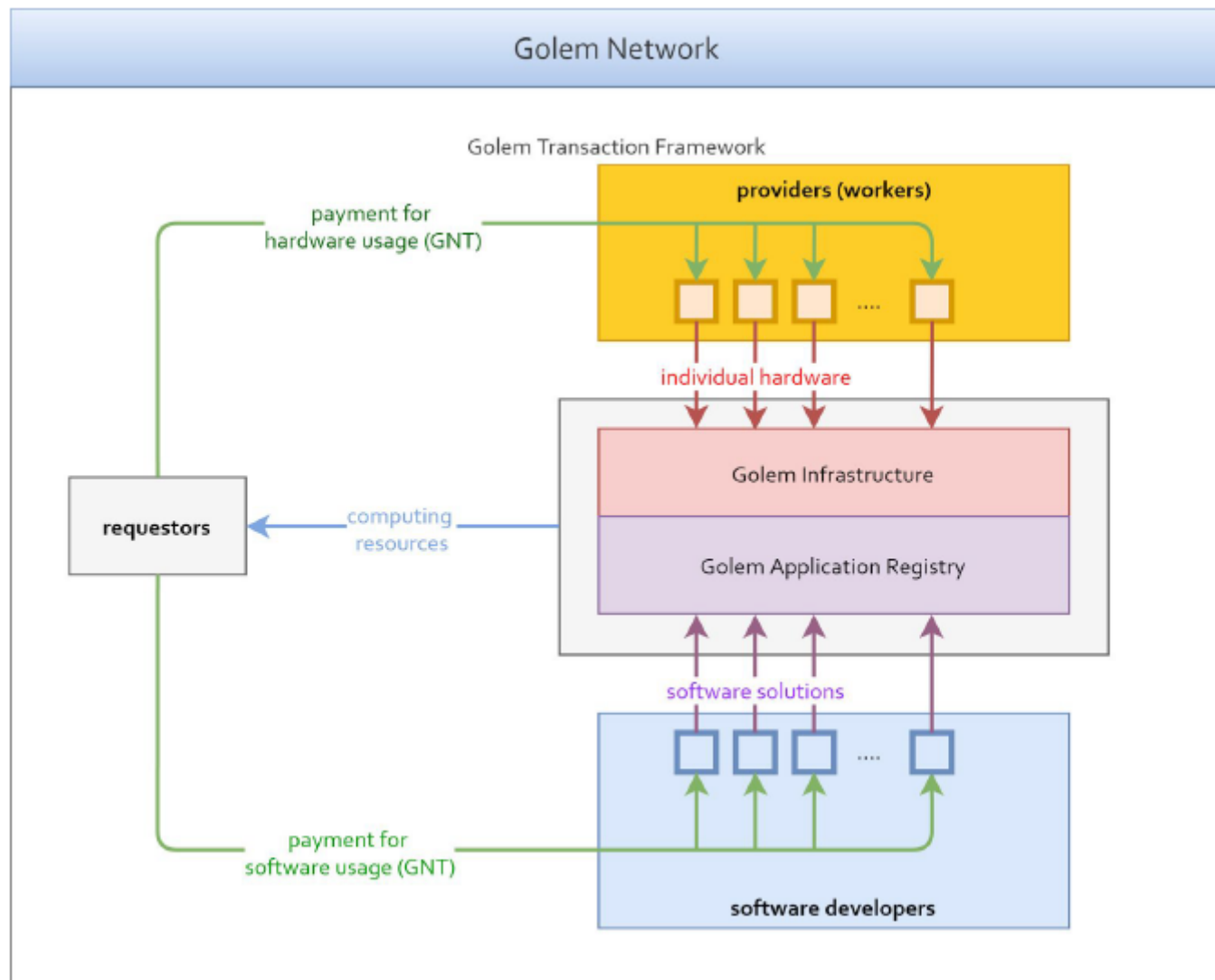
golem
NETWORK



PROVIDER
of computing resources
market demand



DEVELOPERS
Building on top of the network

INTRODUCCION: LA RED GOLEM

INTRODUCCION: ECOSISTEMA GOLEM

SAY HI TO GOLEM'S ECOSYSTEM:

- Future releases of Golem will bring major improvements to the protocol in terms of its flexibility and robustness. In order to expand the user base we are already in the process of integrating a variety of new use cases to Golem in cooperation with our business and technological partners.
- Together with the development of Golem's core infrastructure, our focus is going to shift towards creating tools for developers and software companies. These solutions will make Golem a competitive source of computing power and a viable alternative to existing cloud providers.

INTRODUCCION: INCENTIVOS EN GOLEM

Group	Golem features	Incentive to participate
Requestors	Golem offers tools to execute compute-intensive tasks.	Requestors get access to affordable and scalable solutions, which combine hardware and software.
Providers	Golem combines and utilizes (almost) any kind of existing computing hardware.	Hardware providers get paid for renting out their hardware.
Software Developers	Golem is a flexible platform to deploy and monetize software.	Software developers use Golem as a distribution channel, associated with access to hardware.

INTRODUCCION: GOLEM NETWORK TOKEN

- The Golem Network Token (GNT) account is created during the crowdfunding. GNT is a crucial element of Golem network and will be designed to ensure flexibility and control over future evolution of the project. Following the first release version of Golem, GNT will be attributed a variety of functions in the Golem network.
- Payments from requestors to providers for resource usage, and remuneration for software developers is going to be exclusively conducted in GNT.
- Once the Application Registry and Transaction Framework are implemented, GNT will also be required for other interactions with Golem, such as submitting deposits by providers and software developers or participation in the process of software validation and certification (as described in the Application Registry section). The general conditions for using GNT will be set in the Transaction Framework, but specific forms of these interactions will be possible to define within each software integration.

CASOS DE USO: EJEMPLOS

Some examples of actual and potential uses for the Golem network include:

- CGI Rendering and other VFX pipeline processes (Our first Usecase)
- Testing Hyperparameters for Machine Learning Applications
- Protein folding simulations for Scientific Computing
- Video Transcoding for when you want to watch netflix
- Photogrammetry Reconstruction

CASOS DE USO: RENDERIZADO CGI

USOS DE GOLEM: 1º) RENDER

Blender Rendering, Powered by Golem

The first release of our software, Brass Golem, focuses on a single use case: CGI rendering. As a Requestor in the Golem marketplace, you can distribute processing of any Blender scene over the Golem Network.

The results will arrive much faster than when running the task on your own machine at the price defined by you and accepted by suppliers of computing power (Providers). This creates a healthy competition in the marketplace created by Golem and you always know how much you are going to pay before submitting a task.

CASOS DE USO: RENDERIZADO CGI

The first use case: CGI rendering

The screenshot shows the Golem App interface. On the left is a sidebar with icons for 'New Task', 'Tasks', 'Status', 'Preferences', and 'Account'. The main area displays a table of tasks:

ID	Status	Progress
72e43796-8aed-4da...	Finished	100%
8eee75e0-023d-486...	Finished	100%
fb93c142-2a11-48a...	Finished	100%
40263a65-019f-4bd...	Finished	100%
w115a08c-edae-43b...	Finished	100%
41210b80-70de-4ct...	Computing	37%
d7cb67a5-ecaf-48a...	Not started	0%

Below the table is a 'Task Configuration' section with the following details:

- Estimated memory: 1 MB
- Output File: C:\golem\brw2.JPEG
- Full Task Timeout: 4:00:00
- Subtask Timeout: 20 minutes
- Time Started: 2016.06.27 16:20:55
- Task Resources: [Show Resources](#)

A rendering progress bar is visible, showing a car being rendered. The bottom of the window displays 'Brass Golem (0, 2)'.

CGI rendering is the first and very illustrative case of real Golem usage. Rather than using costly cloud-based services or waiting ages for one's own machine to complete the task, CGI artists can now rent compute resources from other users to render an image quickly. The payment from a requestor (in this case, a CGI artist) is sent directly to providers who made their resources available. In addition, when the artist's machine is idle, it can itself accept tasks from other users.

Golem Alpha release: CGI rendering using Blender
It is public, follow [the link](#) to test Golem.

CASOS DE USO: Machine Learning

USOS DE GOLEM:2º) Machine Learning, Powered by Golem

Apart from the first use case (CGI rendering), we are actively investigating next use cases, with significantly larger addressable market sizes.

One of the future use cases of Golem that we are actively investigating is training machine learning models. This field of computer science is going through its golden age and it has insatiable need for computing power. While right now we're building simple proof of concept demonstrations, our ultimate goal is to be able to provide developers with a set of tools to enable them to host their machine learning stack on Golem. We believe that democratizing access to computing power at competitive price point is very important to the progress of machine learning field.

GOLEM: EL EFECTO RED

The Network Effect:

- Golem is a decentralized network for sharing and leveraging large amounts of computing power.
- The power required to perform critical tasks is available to your team through our vast and growing network of nodes, comprised of individual user machines.
- The Golem team is dedicated to creating an ecosystem for developers to build and share their own distributed task frameworks that harness the growing power of the Golem Network.
- We are actively seeking proposals for usecases, and will even collaborate directly with your team to make them a reality, to provide exposure for your work to a huge audience of users.

BENEFICIOS DE DESARROLLAR CON GOLEM

Benefits of Building with Us:

- Golem is on the bleeding-edge of distributed computing technology and has been making groundbreaking strides in network security, P2P networking, blockchain and decentralized marketplace mechanisms.
- Working with Golem provides more than access to computing resources and a built-in audience for your software. We strongly encourage other developers to team up with us and work together on integrating various software solutions with Golem.
- For the most promising usecase proposals, our team is poised to jumpstart cooperation with:...

BENEFICIOS DE DESARROLLAR CON GOLEM

For the most promising usecase proposals, our team is poised to jumpstart cooperation with:

- A comprehensive review of your project's potential to integrate with Golem
- Technical cooperation on the integration with Golem
- Assistance in setting up a plan to monetize your software using Golem, including licensing models
- Financial support and mentorship for projects in initial phases
- Larger financial contributions for the later stages of cooperation

BENEFICIOS DE DESARROLLAR CON GOLEM

...Our team is poised to jumpstart cooperation with:

- Joint marketing activities for those integrations launched into production
- Ultimately, Golem is going to be a platform for developers open for any type of computing tasks. We already invite you to integrate with the current version of Golem. Soon, however, we are going to release an experimental API to provide developers with more flexible and convenient tools to get started with creating Golem integrations on their own.
- Working with Golem provides more than access to computing resources and a built-in audience for your software. We strongly encourage other developers to team up with us and work together on integrating various software solutions with Golem.

GOLEM PROJECT TIMELINE

BRASS GOLEM

- 1 Basic Task Definition Scheme
- 1 Basic Application Registry
- 1 IPFS integration
- 1 Docker environment with Golem-provided images
- 1 Local verification
- 1 Basic UI and CLI
- 1 Basic reputation system
- 1 Implementation of Blender and LuxRender

ETA: 6 months

CLAY GOLEM

- 1 Basic Task API:
- 1 Initial Transaction Framework Model
- 1 Redundant verification
- 1 Basic subtask delegation
- 2 Support for virtual machines
- 2 Set of extended tutorials for developers
- 2 Computational chemistry use case
- 3 Machine learning use case

ETA: 6-15 months

ETA: 10-15 months

ETA: 13-15 months

IRON GOLEM

- 2 External data link
- 2 Host-direct mode
- 2 Certification support for Environments
- 2 Network Status Dashboard
- 2 Additional security mechanism
- 2 Golem web client
- 3 Provider dashboard
- 3 Golem Developer Toolkit
- 3 Reputation-system: supervising network behaviour
- 3 Advanced transaction system
- 4 devp2p integration
- 4 MapReduce and topological sorting of tasks
- 4 Golem Standard Library

ETA: 24-34 months

ETA: 30-40 months

ETA: 36-48 months

STONE GOLEM

- 1 Full Task API
- 1 Application Registry
- 1 Transaction Framework: task templates:
- 1 Basic Certification support for Software
- 1 Support for SaaS
- 2 SaaS tasks examples

ETA: 15-24 months

ETA: 22-24 months

LEGEND:

- 1 150k ETH financing
- 2 320k ETH financing
- 3 530k ETH financing
- 4 820k ETH financing

GOLEM ROADMAP

CURRENT STATUS

BRASS BETA:

Golem is in its Beta stage named Brass Golem. Users can install the software on a variety of platforms and participate in both using it on mainnet or testing. Brass Golem provides CGI rendering for Blender. The Golem project milestones do not have set dates, Brass is expected to be completed in 2019. To follow our progress, please navigate and follow our Kanban

CLAY:

Clay Golem, the second roadmap milestone, is under development. We are introducing this new milestone in gradual improvements into Brass Golem, adding Clay functionalities, and making the software more robust progressively.

GOLEM ROADMAP

UNLIMITED:

Part of the Golem team is focused strictly on developing Golem Unlimited. This product utilizes trusted heterogeneous computing resources which are part time idle.

Unlimited is meant for data center-like setups (e.g., render farms, or desktops within organisation LAN) where network participants trust each other, however additionally supporting trusted P2P subnetworks (e.g., distributed team machines). The goal of Golem Unlimited is manifold.

First of all, it seeks to broaden the Golem Network reach. Each Golem Unlimited instance will be a separate subnetwork, which can be shared in the Golem network as a single provider.

Secondly, these subnetworks may also be utilized by the business running them—for internal purposes only. We aim to provide a seamless experience regarding the set-up, use, and new integrations.

GOLEM ROADMAP

GOLEM MILESTONES: Brass Golem:

...these are created to fulfill one goal, set at the time of their creation, and wait with absolute patience until activated to perform this task.

Brass Golem is where we are at the moment with our proof-of-concept, at a Beta stage, both mainnet and testnet available. This current version of Golem is only focused on rendering in Blender, and although it will be useful to CGI artists, we consider CGI rendering to be a proof of concept primarily, and also a training ground. Our team understands that Blender CGI rendering will not create enough turnover to cover the work in the project, however we are proud to have launched the first decentralized compute power marketplace.

GOLEM ROADMAP

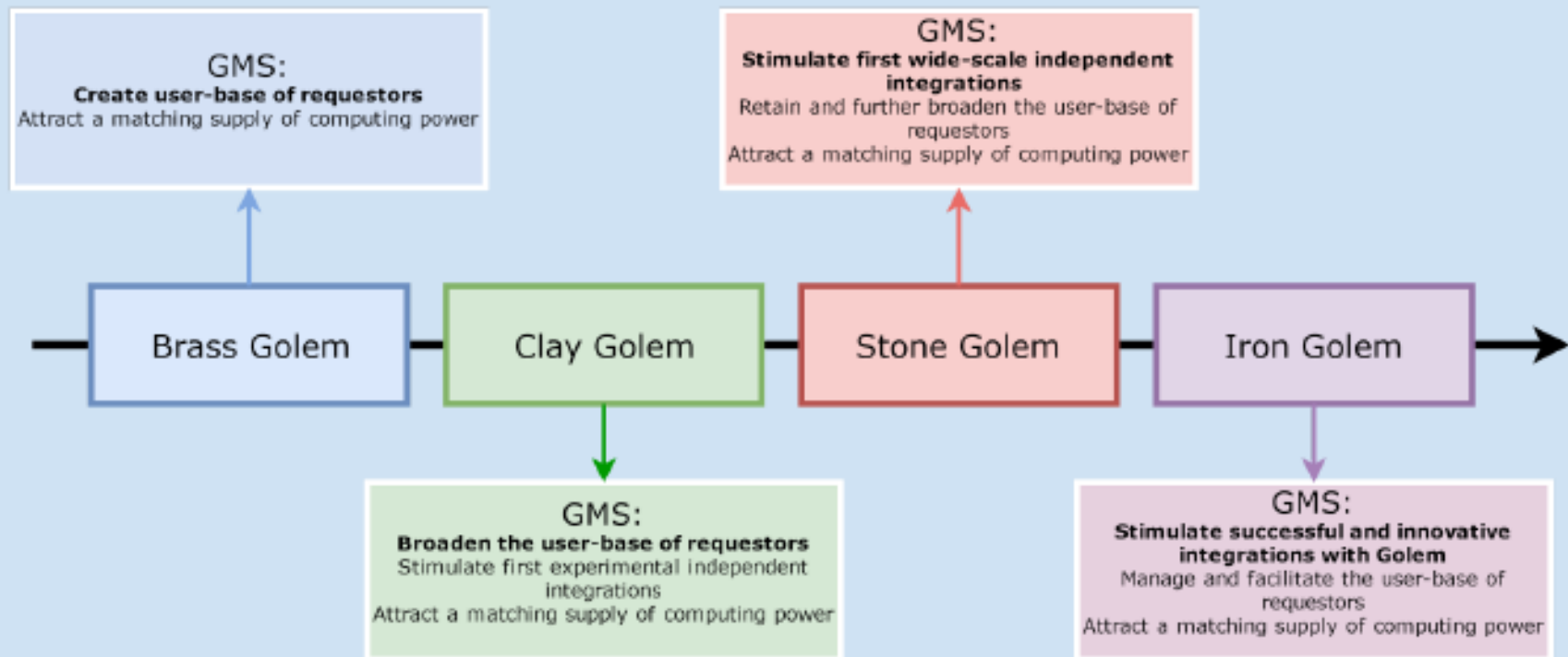
GOLEM MILESTONES: List of proposed functionalities:

Basic Task Definition Scheme:

- Basic Application Registry - first version of Ethereum-based Application Registry which allows to save tasks defined with basic task definition scheme
- IPFS integration for coordinating task data and content delivery, e.g. deliver files needed to compute a task, deliver the results back to the requester
- Docker environment with Golem-provided images for sandboxing the computations
- Local verification: a probabilistic verification system based on the calculation of a fraction of the task on the requestor's machine
- Basic UI and CLI
- Basic reputation system
- Implementation of Blender and LuxRender tasks LuxRender was deferred due to small user base
- Conccent Service

Current version: 0.20.1

ESTRATEGIA DE SALIDA AL MERCADO



Note: Each of the GMS assumes the full level of funding (i.e. the crowdfunding cap is reached). In other scenarios, the GMS will be adjusted to deliverables of a particular funding level.

GOLEM NETWORK TOKEN (GNT): CROWDFUNDING

The supply of GNT will be limited to the pool of tokens created during crowdfunding period.

Creation of the GNT and initial GNT account functionalities

- The Golem Network Token is a token on Ethereum platform. Its design follows widely adopted token implementation standards. This makes it easy to manage using existing solutions including Ethereum Wallet.
- Maximum number of tokens created during crowdfunding period:
 - Total: 1 000 000 000 (100%)
 - Crowdfunding participants: 820 000 000 (82%)
 - Golem team 60 000 000 (6%)
 - Golem Factory GmbH 120 000 000 (12%)
- Sending 1 ether to the GNT account will create 1 000 GNT
- No token creation, minting or mining after the crowdfunding period.
- Tokens will be transferable once the crowdfunding is successfully completed.

Go to the [crowdfunding section](#) to learn the details and see how to support the Golem Project via crowdfunding.

GOLEM: RENDIMIENTO APROXIMADO EN UN AÑO (1 MÁQUINA):

Make Money With Golem One Year On

Making Money With Golem - One Year On

Real World Results

Over the last year (380 days)

Total earned - 533 GNT

Daily earned - 1.4 GNT

Today's Price (\$0.09): Total \$48.52 - Daily \$0.13

ATH Price (\$1.15): Total \$612.95 - Daily \$1.61

Future Price? (\$10): Total \$5330 - Daily \$14

CONCLUSIONES

CONCLUSIONES:

- Puede ser una gran oportunidad para los desarrolladores
- Seguramente sea provechoso para quien necesite gran potencia de cálculo y encuentre la manera de poder ejecutar esa tarea en Golem: render para Blender...
- Para invertir, en principio no parece un gran negocio, al menos alquilando una o pocas máquinas
- Lo mismo puede ser interesante para centros de proceso de datos, o para una empresa que quiera sacar algo de rendimiento
- Pero la cosa puede cambiar, si el precio de los GNT subiera mucho y tuvieras almacenado

ENLACES:



golem.network



contact@golem.network



twitter.com/golemproject



reddit.com/r/GolemProject



chat.golem.network

OTROS ENLACES: <http://blockmad.lleo.net/>

GOLEM: DEMO

GOLEM: DEMO

DEMO: Instalación de Golem en Windows 10**Components:**

Golem is open source software, distributed under GPLv3 license.

It communicates with external technologies. Some of them may be downloaded and installed with the Golem package:

Docker (Apache License 2)

Freemage (GPLv3)

OpenEXR (modified BSD)

OpenSSL (OpenSSL License)

Python3.6 (PSF license)

OpenCV

Crossbar

Productos Disponibles: Brass Beta

Versiones: Golem Brass beta en Windows 10, MacOs, Ubuntu.

DEMO: Instalación de Golem en Windows 10**Requerimientos:****Windows 10 Pro:**

La versión HOME no permitirá instalar Hyper V, en cuyo caso debemos usar docker toolbox.

<https://github.com/docker/toolbox/releases/download/v19.03.1/DockerToolbox-19.03.1.exe>

Visual C++ 2015:

https://download.microsoft.com/download/0/6/4/064F84EA-D1DB-4EAA-9A5C-CC2F0FF6A638/vc_redist.x64.exe

DEMO: Instalación de Golem en Windows 10**Requerimientos:**

Hyper V-NOTA: Tener otros sistemas de virtualización como Vmware o Docker podría afectar el correcto funcionamiento de Golem.

Descargamos el ejecutable:

<https://golem-releases.cdn.golem.network/releases/0.20.1/golem-0.20.1-windows.exe>

Video de Instalación:

<https://www.youtube.com/watch?v=5ji7H1PnuTo>

DEMO: Instalación de Golem en Linux (Ubuntu)**Descargamos el ejecutable:**

https://raw.githubusercontent.com/golemfactory/golem/0.20.2/Installer/Installer_Linux/install.sh

Damos permisos de ejecución al script y lo lanzamos:

```
chmod +x install.sh && ./install.sh
```

Vídeo de instalación:

<https://youtu.be/OPpB3C15S4A>

GOLEM: DEMO

PARA SUBIR UNA TAREA A GOLEM (YOUTUBE):

1ª PARTE:

<https://www.youtube.com/watch?v=0yV0LNE2prU>

2ª PARTE:

<https://www.youtube.com/watch?v=BebXK4TQEeU>

3ª PARTE:

<https://www.youtube.com/watch?v=19viaYSrXOc>

AGRADECIMIENTOS



¡Muchas Gracias!

Juan Antonio Lleó:

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BlockMAD: Grupo de Blockchain orientado al desarrollo
<https://www.meetup.com/es-ES/BlockMAD/>

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Hack Madrid %27

<https://hackmadrid.org>

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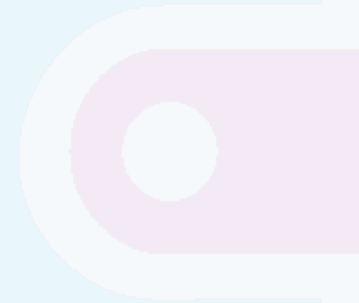
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FIN

FIN



FIN

FIN



CASOS DE USO: RENDERIZADO CGI

BLOCCX=MAD

