



Grid Network System

Applications

- Hardware Virtualization (data center, etc.)
- Cloud Computing
- Intelligence Data to Information to Knowledge Conversion
- Massive Data Manager/Processor
- Network Management and Control
- Signal Intelligence (SIGINT)
- Electronic Intelligence (ELINT)
- Communications Intelligence (COMINT)
- Imagery Intelligence (IMINT)
- Measurement and Signature Intelligence (MASINT)
- Photographic Intelligence (PHOTINT)
- Steganographic Intelligence (STEGINT)
- Voice Recognition (VR)
- Audio Processing and Analysis
- Digital Signal Processing (DSP)
- Cognitive Computing Infrastructure
- C4ISR System
 - Coordinate Control
 - Multiple Algorithm/Multiple Asset
 - Common Operating Picture
 - Heterogeneous Sensor Unified Structure
- Scientific Research Algorithm Management/Processing

Key Features

- Massive Data Collection, Storage, Collaboration and Processing
- Encompasses processing assets under a unified processing architecture
- Virtualizes Hardware
- Provisioning Management
- Service Oriented Architecture (SOA)
- Web Service Based Application – J2EE / JBOSS
- Distributed Database Capabilities
- Supports Flexibility with Software Development Kit (SDK)
- Supports Spiral Development
- Platform Independence
- Metadata Manager
- Batch Publishing Capability
- Intelligent Services
- Data Atomization - .ppt, .zip, etc.
- Data Fusion
- Open Source Tools
- Tool Management
- Asset / Resource Scheduling
- Client Configuration Control
- Extended Encryption – https: Transfers / File System

Description

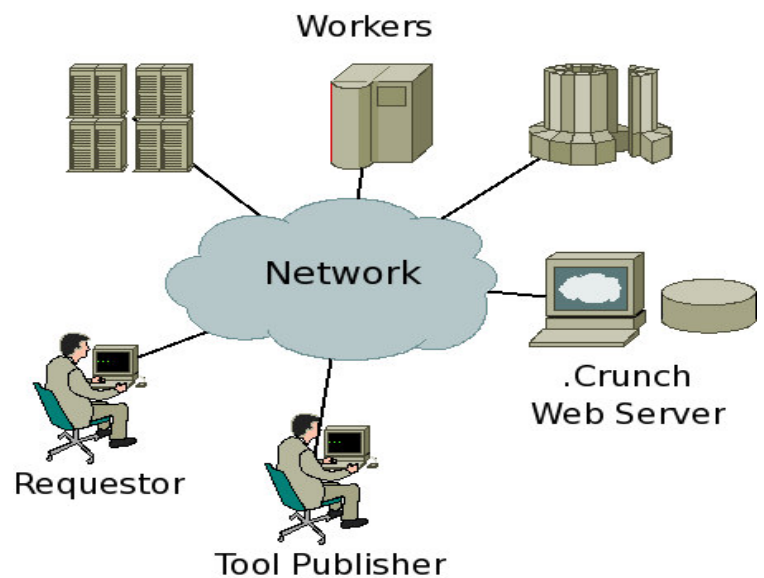
The .CRUNCH system is a Java based, application-neutral, grid computing infrastructure which utilizes computational and data resources on a network for processing and is implemented using Web Services in a Service Oriented Architecture (SOA). The system allows units of work (workflows and their jobs) to be submitted by member users, collectively known as subscribers, for processing by one or more of the multiple processing nodes at its disposal.

The .CRUNCH system is architected as a medium sized Grid Processing Network incorporating a highly modular design. Through planned enhancements, joining additional instances of .CRUNCH will result in a vast and virtually endless Grid-of-Grids.

The .CRUNCH Grid Network System leverages the power of distributed processing over a web services based SOA to accomplish extremely large and resource intensive processes in a more efficient and timely manner. To date .CRUNCH has been leveraged in a variety Department of Defense projects including the accelerated detection of Steganographic material and within the areas of forensic analysis of Voice Recognition and Audio Processing.

The .CRUNCH system integrates core Java and C code with open-source tools including MySQL for database management, JBOSS web services application server, and a Linux-based operating system. Processing nodes include support for both Linux and Windows XP based systems. These network subscribed processing nodes can include anything from Supercomputers, PC's, Workstations to Application Specific Hardware.

.CRUNCH is distributed with a flexible Software Development Kit (SDK) which enables individual users to develop fully customized toolsets and applications to support their own specific needs. It includes a variety of beneficial features including Client Configuration Control, Task scheduling, Resource management, File and Data Atomization and Fusion, Metadata Management, and Spider Search capabilities.



.Crunch Grid System

.CRUNCH Architecture

.CRUNCH (pronounced “dot crunch”) is a Service Oriented Architecture (SOA), web services-based grid computing infrastructure that implements a distributed software architecture consisting of a set of core servers, remote data stores, managed resources and remote client software. Key distinguishing characteristics of the .CRUNCH architecture include distribution of processing tasks to a set of subscribed resources within a network (including the Internet or a Local Area Network) and the use of an SOA to facilitate the integration of new and improved algorithms. CEI developed .CRUNCH under a Phase II SBIR for the Air Force and has applied the technology to the acceleration of Steganographic Detection (Stegi@Work) and Voice Recognition and Audio Processing (DISP).

.CRUNCH offers an inherent ability to task, control, and communicate with a variety of network resources, to fuse their results, and to pass those results back to the originating requestor client. These features can be leveraged to realize a web service capable of ensuring all data passing through it is appropriately labeled or otherwise correctly handled.

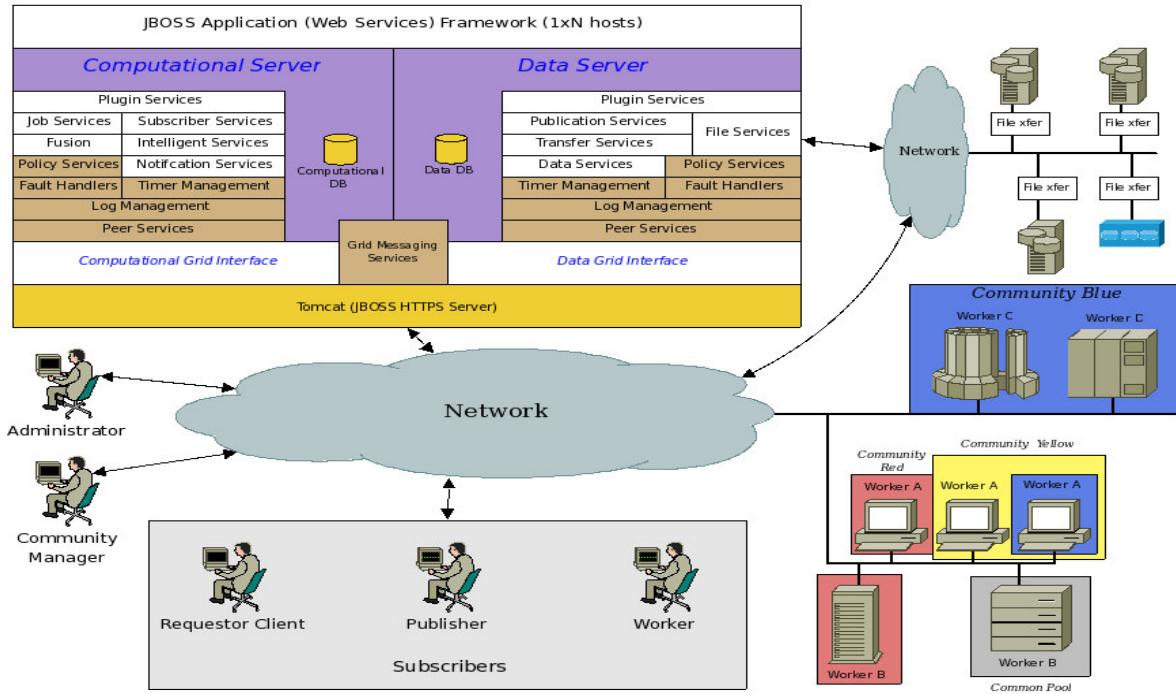
.CRUNCH uses technologies including Web Services, XML-RPC, JAX-WS over SOAP, and Java Messaging Service. It handles and manages data and metadata, manages distributed databases, and provides Quality of Service (QoS). .CRUNCH also provides fine grain control over policy management and resource allocation.

.CRUNCH is divided into three primary components: subscribers (users of the grid), managed resources (computing and data store systems) and core servers which coordinate the resources for the subscribers. The .CRUNCH infrastructure supports two kinds of grids: a computational grid and a data grid. The computational grid supports use of the resources for general purpose computing while the data grid supports resource use for data transfer, manipulation and storage.

Both types of supported grids include core server software which operates separate software entities and which may be deployed on the same server hardware and may be instantiated one or more time within the grid. The core server entities are implemented as a series of Web Services utilizing a variety of protocols with a heavy emphasis on XML-RPC (implemented using JAX-WS over SOAP) and asynchronous messaging (primarily using Java Messaging Service, or JMS) for messaging between remote systems, data storage, and the .CRUNCH core servers.

.CRUNCH distinguishes between types of volunteers (called subscribers) and offers fine grain control over policy management and resource allocation. Requesting subscribers drive the work based on administered policies. These policies determine which network resources will be available for computational and storage needs. The ability of .CRUNCH to control policy management and resource allocation could also provide a good foundation for prototype security systems leveraging intelligent information agents.

.Crunch Grid Services



.Crunch Clients

System Requirements

Memory: 512 MB Required (2 GB Recommended)
Hardware Platform: x86-based
Operating Systems:
 Server OS: Fedora Core 5/Core 6 Linux
 Client OS: Fedora Core 5/Core 6 Linux, or Windows XP
 (Other Linux based systems to be supported in future releases)

Software Requirements

Required:
 MySQL
 Sun Java Development Kit (JDK) Version 1.5
Included with Installation:
 JBOSS Application Server

Ordering Information (Please Contact CEI for Pricing, Availability, and Information on Additional Configurations and Tailored Solutions)



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