

The (B)right future of software installation

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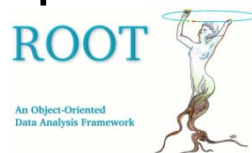
WHAT IS THE BEST METHOD TO INSTALL SOFTWARE?

- What to install
- Where/when to do it
- How should it be done



- Two types of packages:

- Experiment software:



, GEANT3,



AliRoot

See P. Hristov talk on
Thursday, The ALICE
Offline Framework

- GRID interface:



- Requirements

- Self-contained
 - Platform dependent
 - User space
 - Size does matter





AliEn BITS Global View

i686 | x86_64 | Itanium | IntelMac | IntelMac64 | VM_i686 | SLC5_i686 | SLC5_x86_64 | UBUNTU_x86_64 | Show AliEn Test results

[Jump to i686](#)

AliEn Releases for i686-pc-linux-gnu

| Release | Date | Description | Status | Built on | Build time | Build # |
|---------|------------|------------------|--------|--------------------------|------------|---------|
| HEAD | --f-- | Current CVS head | ✓ | Wed Mar 11 16:10:29 2009 | 00:08:28 | 30 |
| v2-16 | 18/11/2008 | Stable | ✓ | Wed Mar 11 14:39:40 2009 | 00:08:27 | 48 |
| v2-15 | 14/05/2008 | Stable | ✓ | Fri Nov 14 18:06:16 2008 | 00:05:20 | 64 |
| v2-14 | 06/12/2007 | Stable | ✓ | Tue Apr 22 13:54:10 2008 | 00:02:51 | 2 |
| v2-13 | 23/04/2007 | Stable | N/A | N/A | N/A | N/A |
| v2-12 | 29/11/2006 | Stable | N/A | N/A | N/A | N/A |
| v2-11 | 07/09/2006 | Stable | N/A | N/A | N/A | N/A |
| v2-10 | 15/05/2006 | Stable | N/A | N/A | N/A | N/A |

Generated on: Wed Mar 11 16:11:26 2009

Installation Tests for i686-pc-linux-gnu

| Release | Build # | Built on | Test Status | Test # |
|---------|---------|--------------------------|-------------|--------|
| HEAD | 30 | Wed Mar 11 16:10:29 2009 | ✓ | Thu |
| v2-16 | 48 | Wed Mar 11 14:39:40 2009 | ✓ | Wed |
| v2-15 | 64 | Fri Nov 14 18:06:16 2008 | ✓ | Fri N |
| v2-14 | 2 | Tue Apr 22 13:54:10 2008 | ✗ | Tue |

Generated on

[Jump to i686](#)

[Jump to x86_64](#)

AliEn Releases for x86_64-unknown-linux

| Release | Date | Description | Status | Built on |
|---------|------------|------------------|--------|-----------------------|
| HEAD | --f-- | Current CVS head | ✓ | Wed Mar 11 17:09:17 |
| v2-16 | 18/11/2008 | Stable | ✓ | Wed Mar 11 14:50:51 |
| v2-15 | 14/05/2008 | Stable | ✓ | Fri Nov 14 22:04:45 2 |
| v2-14 | 06/12/2007 | Stable | ✗ | Tue Sep 9 18:29:52 2 |
| v2-13 | 23/04/2007 | Stable | N/A | N/A |

AliEn Build Integration and Testing System

Platform: i686-pc-linux-gnu
Release: v2-16
Go to: All Releases | HEAD | v2-16 | v2-15 | v2-14 | Test Logs

AliEn Installation Tests for v2-16

| Build number | Built on | Test # |
|--------------|--------------------------|--------|
| 48 | Wed Mar 11 14:39:40 2009 | Wed |

Test progress
Overall Status Stopped AliEn (before) Cleanup Installer Rev
✗ ✓ ✓ ✓ ✓ 1

Test details
Create cert New VO User tests APP
✓ ✓ ✗

| AliEn Services | Failed Tests |
|--------------------------|------------------------------|
| ApiService.log | 10.test603-aliensh-basics |
| Authen.log | 10.test97-pam |
| Authen.log back | 11.test00-createKeys |
| Broker.Job.log | 11.test610-xrootd-se |
| Broker.Job.log back | 111.test20-dfiles |
| Broker.Transfer.log | 124.test302-bankUserCommand |
| Broker.Transfer.log back | 125.test303-bankAdminCommand |
| CE.log | 126.test304-evacOrder |
| CTC.log back | 130.test305-testUserCommand |

Main Log:

```
Starting FITS (2009_03_11-15:02)...
Shell limits:
core file size      (blocks, -c) 0
data seg size       (kbytes, -d) unlimited
file size           (blocks, -f) unlimited
pending signals     (-l) 1024
max locked memory   (kbytes, -l) 32
max memory size     (kbytes, -m) unlimited
open files          (-n) 1024
pipe size           (512 bytes, -p) 8
```

AliRoot BITS Global View

i686 | x86_64 | Itanium | IntelMac | IntelMac64 | About AliRoot

AliRoot Releases for i686-pc-linux-gnu

| Release | Date | Description | Status | Built on | Build time | Build # |
|--------------|------------|------------------|--------|--------------------------|------------|---------|
| HEAD | --f-- | Current CVS head | N/A | N/A | N/A | N/A |
| v4-16-Rev-06 | 02/03/2009 | 02/03/2009 | ✓ | Thu Mar 12 07:11:22 2009 | 05:34:59 | 4 |
| v4-16-Rev-05 | 28/01/2009 | 28/01/2009 | ✓ | Sat Jan 31 07:05:19 2009 | 05:26:35 | 3 |
| v4-16-Rev-04 | 22/01/2009 | 22/01/2009 | ✓ | Sat Jan 24 06:58:53 2009 | 05:28:55 | 2 |
| v4-16-Rev-03 | 19/12/2008 | 19/12/2008 | ✓ | Tue Jan 6 06:32:05 2009 | 05:26:30 | 6 |
| v4-16-Rev-02 | 12/12/2008 | 12/12/2008 | ✓ | Fri Dec 12 18:40:50 2008 | 05:30:05 | 2 |
| v4-16-Rev-01 | 13/11/2008 | 13/11/2008 | ✗ | Thu Nov 13 14:47:17 | 1 | |

[Jump to x86_64](#)

AliRoot Releases for x86_64-unknown-linux-gnu

| Release | Date | Description | Status | Built on | Build time | Build # |
|---------|-------|------------------|--------|----------|------------|---------|
| HEAD | --f-- | Current CVS head | N/A | N/A | N/A | N/A |



More than 200 individual packages

AliEn Build Integration and Testing System
Platform: i686-pc-linux-gnu
Release: HEAD

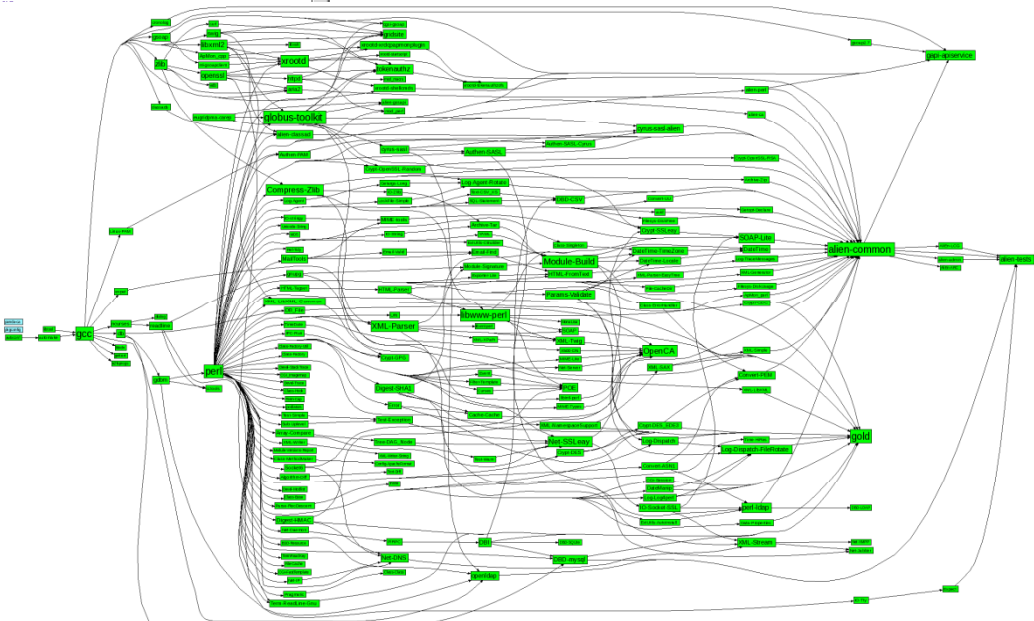
Goto: [All Releases](#) | [All Build](#) | [alien](#) | [base](#) | [devel](#) | [gcc](#) | [monitor](#) | [portal](#) | [server](#) | [All SLOC](#) | [All Dependencies](#) | [Alien Tests](#) | ...

alien

| Package | Version | Status | Prepare | Make | -install | -test | -cache | -autopkg | Files | Licens |
|------------------|-----------|--------|---------|------|----------|----------|--------|----------|-------|--------|
| alien-admin | HEAD_19 | ✓ | OK | OK | OK | N/A | OK | OK | 325KB | - |
| AliEn-ARC | HEAD_18 | ✓ | OK | OK | OK | OK | OK | OK | 14KB | - |
| alien-classad | 2.1.1_3 | ✓ | OK | OK | OK | OK | OK | OK | 104KB | - |
| alien-common | HEAD_18 | ✓ | OK | OK | OK | N/A | OK | OK | 2MB | - |
| gapi-apiservice | 2.1.16_18 | ✓ | OK | OK | OK | N/A | OK | OK | 6MB | - |
| alien-gssapi | 2.1.6_4 | ✓ | OK | OK | OK | N/A | OK | OK | 40KB | - |
| AliEn-LCG | HEAD_19 | ✓ | OK | OK | OK | OK | OK | OK | 82KB | - |
| alien-perl | 2.1.2_3 | ✓ | OK | OK | OK | N/A | OK | OK | 3KB | - |
| cyrus-sasl-alien | 2.1.22_5 | ✓ | OK | OK | OK | N/A | OK | OK | 143KB | - |
| alien-tests | HEAD_20 | ✓ | OK | OK | OK | N/A | OK | OK | 444KB | - |
| Total | 10 pkgs | 10 | 10 | 10 | 10 | 3, 7 n/a | 10 | 10 | 10MB | 10 n/a |

base

| Package | Version | Status | Prepare | Make | -install | -test | -cache | -autoaka | Files | Licens | Time | Time |
|-------------------|---------------|--------|---------|------|----------|-------|--------|----------|-------|--------|--------------------------|----------|
| Algorithm-Diff | 1.1901_3 | ✓ | OK | OK | OK | OK | OK | OK | 137KB | Perl | Thu Feb 26 17:46:33 2009 | 00:00:14 |
| ApMon_perl | 2.2.19_3 | ✓ | OK | OK | OK | OK | OK | OK | 124KB | - | Tue Mar 10 20:36:13 2009 | 00:00:12 |
| ApMon_cpp | 2.2.6_2 | ✓ | OK | OK | OK | N/A | OK | OK | 313KB | - | Tue Mar 10 20:36:26 2009 | 00:00:13 |
| Archive-Tar | 1.29_3 | ✓ | OK | OK | OK | OK | OK | OK | 142KB | Perl | Thu Feb 26 17:47:04 2009 | 00:00:31 |
| Archive-Zip | 1.16_3 | ✓ | OK | OK | OK | OK | OK | OK | 256KB | Perl | Thu Feb 26 18:57:55 2009 | 00:01:36 |
| Array-Compare | 1.16_3 | ✓ | OK | OK | OK | OK | OK | OK | 30KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| Authen-PAM | 0.15_3 | ✓ | OK | OK | OK | N/A | OK | OK | 61KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| Authen-SASL | 2.10_4 | ✓ | OK | OK | OK | OK | OK | OK | 87KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| Authen-SASL-Cyrus | 0.13-server_4 | ✓ | OK | OK | OK | N/A | OK | OK | 53KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| BSD-Resource | 1.2901_3 | ✓ | OK | OK | OK | OK | OK | OK | 72KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| Cache-Cache | 1.04_3 | ✓ | OK | OK | OK | OK | OK | OK | 243KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |
| Class-Base | 0.03_3 | ✓ | OK | OK | OK | OK | OK | OK | 49KB | Perl | Thu Feb 26 17:47:13 2009 | 00:00:09 |



Easy to add new packages,
move to new platform, get files
from different sources, apply
patches, define dependencies ...





- Combine all the required grid packages into distributions
 - Full installation: 155 MB, mysql, ldap, perl, java...
 - VO-box: 122 MB, monitor, perl, interfaces,
 - User: 55 MB, API client, gsoap, xrootd
 - Worker node: 34 MB, min perl, openssl, xrootd
- Experiment software:
 - AliRoot: 160 MB
 - ROOT: 60 MB
 - GEANT3: 25MB

300 MB
to run
jobs





- Current scenario

- One installation (per platform) per site

- On a shared area

- High bandwidth
 - Security risk

Do we need it?

- AliEn installation:

- New sites: running a script
 - Updating a site: triggered by a VO admin

- Experiment software:

- Install on demand according to the jobs
 - Before submitting JobAgents



Can we do something better?



- Automatic installation on every worker node
- Automatic
- Self-contained
- User space
- Small software (300 MB)
- Job Agents (can run more than one small job)





- Landing on a virgin worker node
- Sending a small script that:
 - Finds a scratch area in a local disk
 - Installs latest version of AliEn
 - Simple requirements: wget
 - Starts a Job Agent
 - JobAgent will install required experiment software
 - After finishing, removes everything
 - Or leaves it for the next agent... (still to be evaluated)

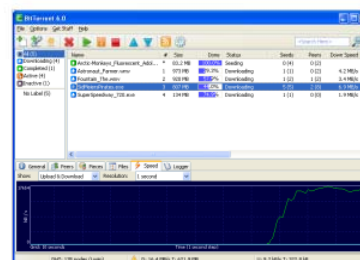
But how to get the files...



More than 150 million users!!

Get BitTorrent

Harness a community of over 150 million users to deliver files to your PC faster than anything else.



The new BitTorrent 6 for Windows brings together BitTorrent's proven expertise in networking protocols with µTorrent's efficient implementation and compelling UI to create a better BitTorrent client. For questions about the BitTorrent client, take a look at the FAQ in our [support center](#), or visit the [client forums](#).

Advertisement

Get BitTorrent

Download other versions:

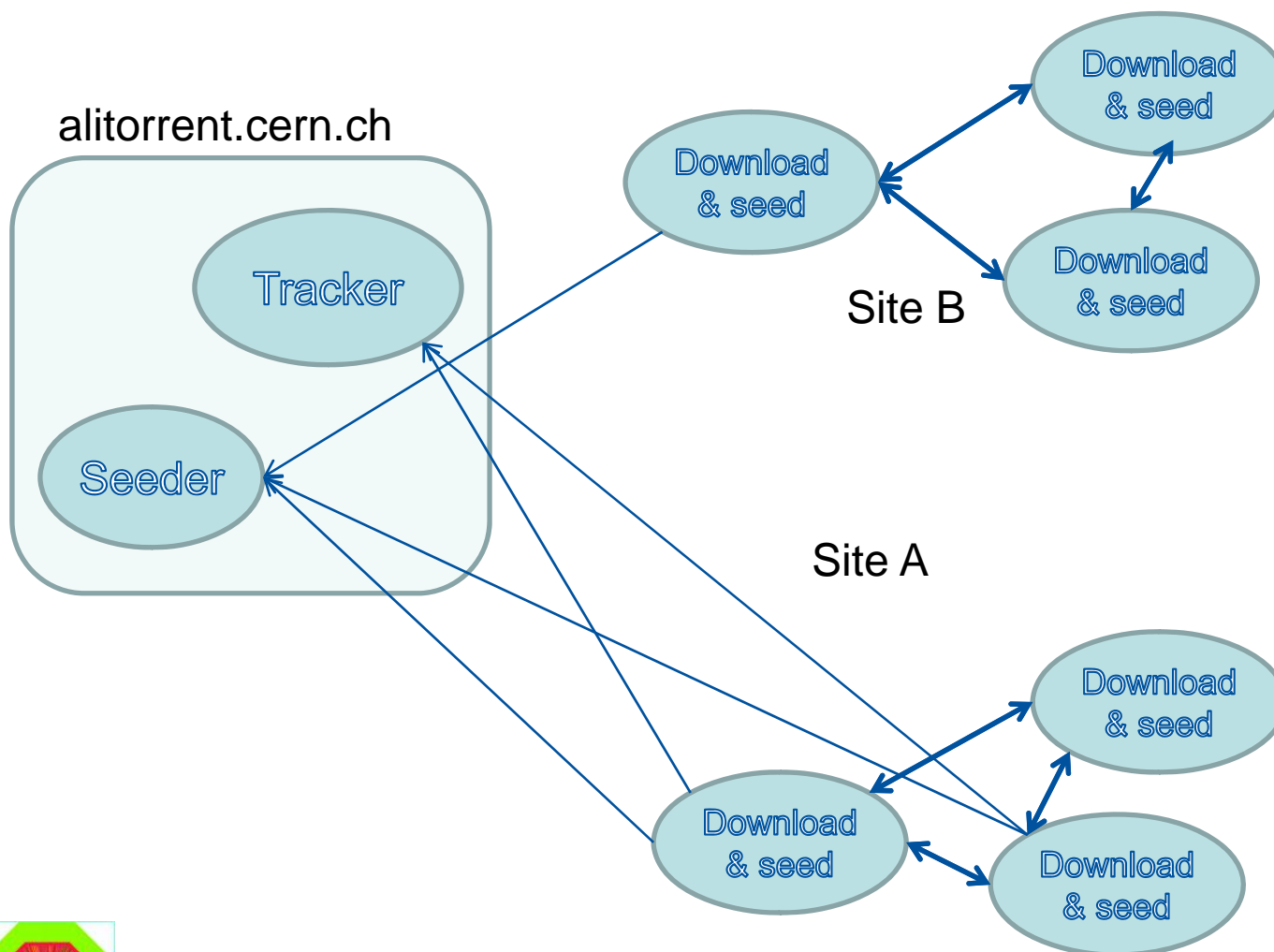
- [BitTorrent for Windows](#)
- [BitTorrent for MacOS X](#)
- [Linux, Source Code, and Older Versions](#)

If you encounter any problems, please report them in the [Client Forums](#).

BitTorrent 6 Features

- Lightweight client
- Local peer discovery
- Configurable bandwidth scheduler
- Global and per-torrent speed limiting
- RSS Downloader
- [Always Spyware-Free](#)

http://bittorrent.com

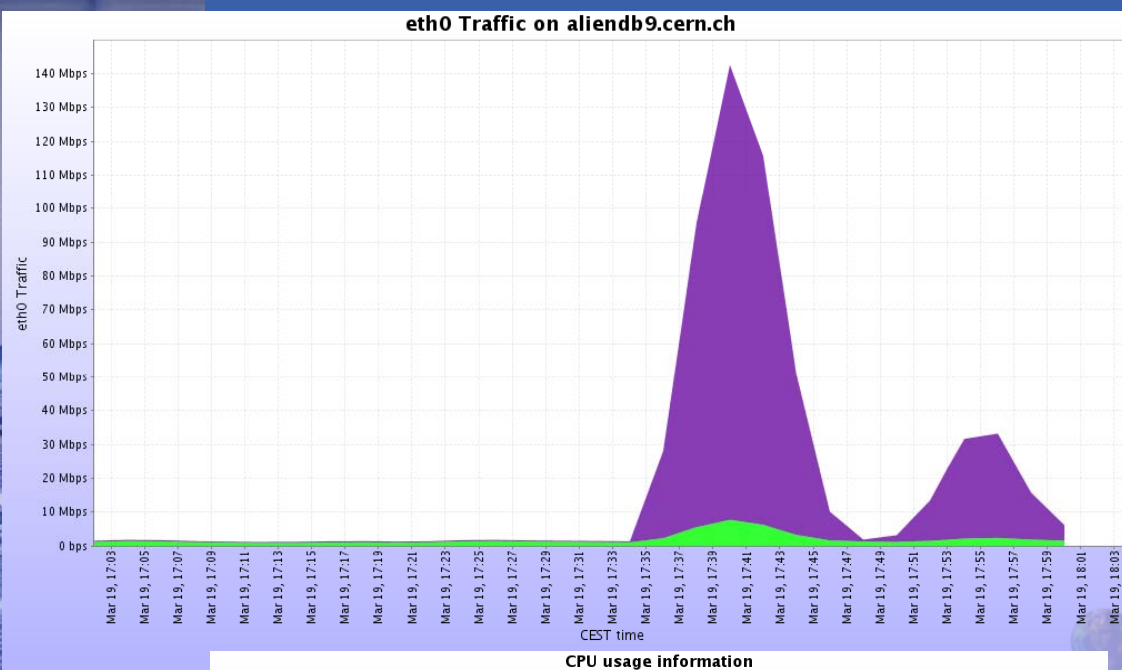




- Torrent files created from the build system
- One seeder at CERN
 - Standard tracker and seeder.
- Get torrent client from ALICE web server
 - Aria2c
- Download the files and install them
- Seed the files while the job runs



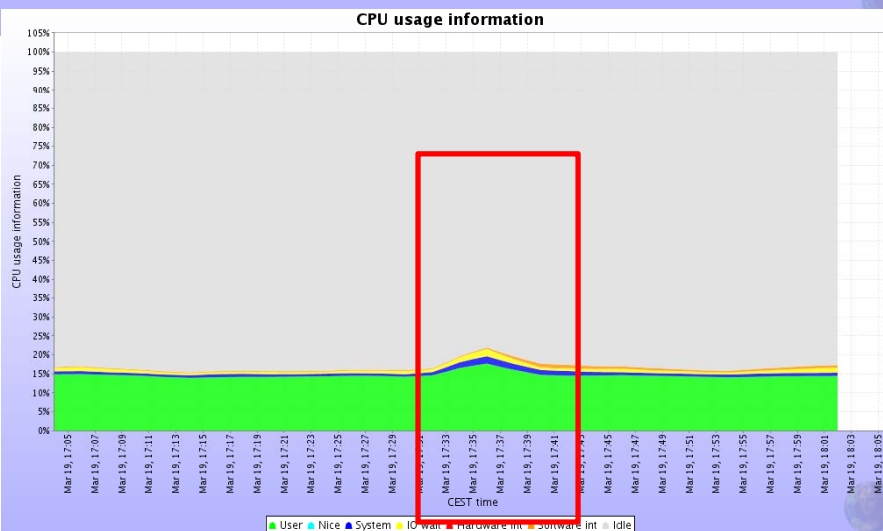
Load on the server



600 clients at CERN:
 $600 \times 300\text{MB} = 180\text{GB}$

Downloaded from the
server: 7GB

Fetches from other wn:
173GB



Negligible CPU load
Network load limited by
conf
Network load does not
increase with more
clients



- Working in collaboration with CERN Security team
- Peer-peer is allowed for professional usage
- Torrent files have checksums to detect corrupted files/wrong files
- Only VO admin can register files in tracker
- Signing the packages





- What if a wn modifies a file?
 - Torrent technology detects and prevents it



- Each chunk is individually signed
 - The whole file can be also signed with a certificate
- Can any user transfer files?
 - NO. Only VO admin can register files in the tracker
- Do site admins have to open ports on wn?
 - Only within the site





- Involve more sites
 - Do we need more seeders?
 - One main seeder should be enough
 - Otherwise, add seeder to (some) voboxes, or to other machines
- Larger scale
 - We have verified up to $O(1000)$ jobs
- Reuse downloaded files on the same wn





- Build and test system for multiple platforms
 - Small, self-contained packages
- GRID software updates triggered by VO admin
- Automatic installation on every worker node
- Using torrent technology to transfer files
 - Already tested by millions of users
 - Reduce inter-site transfers
 - No extra requirements on worker nodes
- No need for a shared area
- Same algorithm could be used by other VOs

