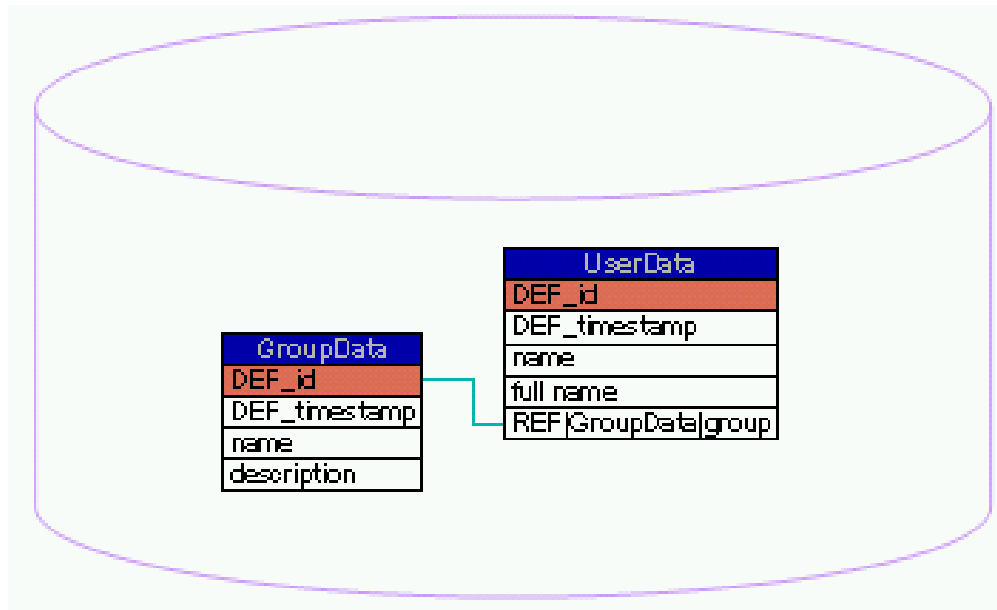


What does the database need to do?



- **Storage** of a large amount of data,
- **Speed** and flexibility to add/access data,
- **Share** data between applications,
- **Data keeper**

How to Query?

- dbemtools, Web based interfaces (Image Viewer, ...)
- Sinedon
- SQL client



Sinedon

- ✓ Sinedon is a simple way to define an **Object Relational Mapping** between Python objects and MySQL, a relational database management system
- ✓ Associates a table with a class or a subclass.
- ✓ Defines relationships between objects.
- ✓ Multiple databases can be used
- ✓ Generated database is normalized (Primary keys, indexes, unique row)
- ✓ the SQL level is completely transparent to the user, only an empty database is needed.

Sinedon

This is a simple example showing some subclasses of `sinedon.Data`. Each class will correspond to a table in a database. The fields (columns) of the table are defined by the `typemap` class attribute.

```
import sinedon
```

```
class Group(sinedon.Data):  
    def typemap(cls):  
        return sinedon.Data.typemap() + (  
            ('name', str),  
            ('description', str),  
        )
```

```
class User(sinedon.Data):  
    def typemap(cls):  
        return sinedon.Data.typemap() + (  
            ('name', str),  
            ('username', str),  
            ('group', Group),  
        )
```

Sinedon Query

```
### create instance of User with a reference to an instance of Group ###
```

```
import mydata
```

```
g = mydata.Group(name='AMI', description='Automated Molecular Imaging Group')  
u = mydata.User(name='Bob', group=g)
```

```
# Recursively insert a new row into each table
```

```
u.insert()
```

```
# Query
```

```
results = u.query()
```

Database Synoptic

nodespecdata	
DEF_id	
DEF_timestamp	
class string	
alias	
launcher alias	
SEQ args	
new process flag	
SEQ dependencies	
REF ApplicationData application	

PresetsManagerSettingsData	
DEF_id	
DEF_timestamp	
stage always	
name	
xy only	
reuse time	

SessionData	
DEF_id	
DEF_timestamp	
name	
REF UserData user	
image path	
comment	
REF InstrumentData instrument	

Stage	
DEF_id	
DEF_timestamp	
REF SessionData session	
label	
magnification	
axis	
x	
y	
delta	
imagex	
imagey	
high tension	
REF InstrumentData instrument	
REF InstrumentData instrument	

on	
ata source	

AcquisitionImageData	
DEF_id	
DEF_timestamp	
REF SessionData session	
filename	
label	
REF ScopeEMData scope	
REF CameraEMData camera	

AcquisitionImageTargetData	
DEF_id	
DEF_timestamp	
REF SessionData session	
delta row	
delta column	
REF ScopeEMData scope	
REF CameraEMData camera	
REF PresetData preset	
REF AcquisitionImageData image	
type	
version	
number	
status	
pre_exposure	
REF GridData grid	

DarkImageData	
DEF_id	
DEF_timestamp	
REF AcquisitionImageData image	
REF SessionData session	

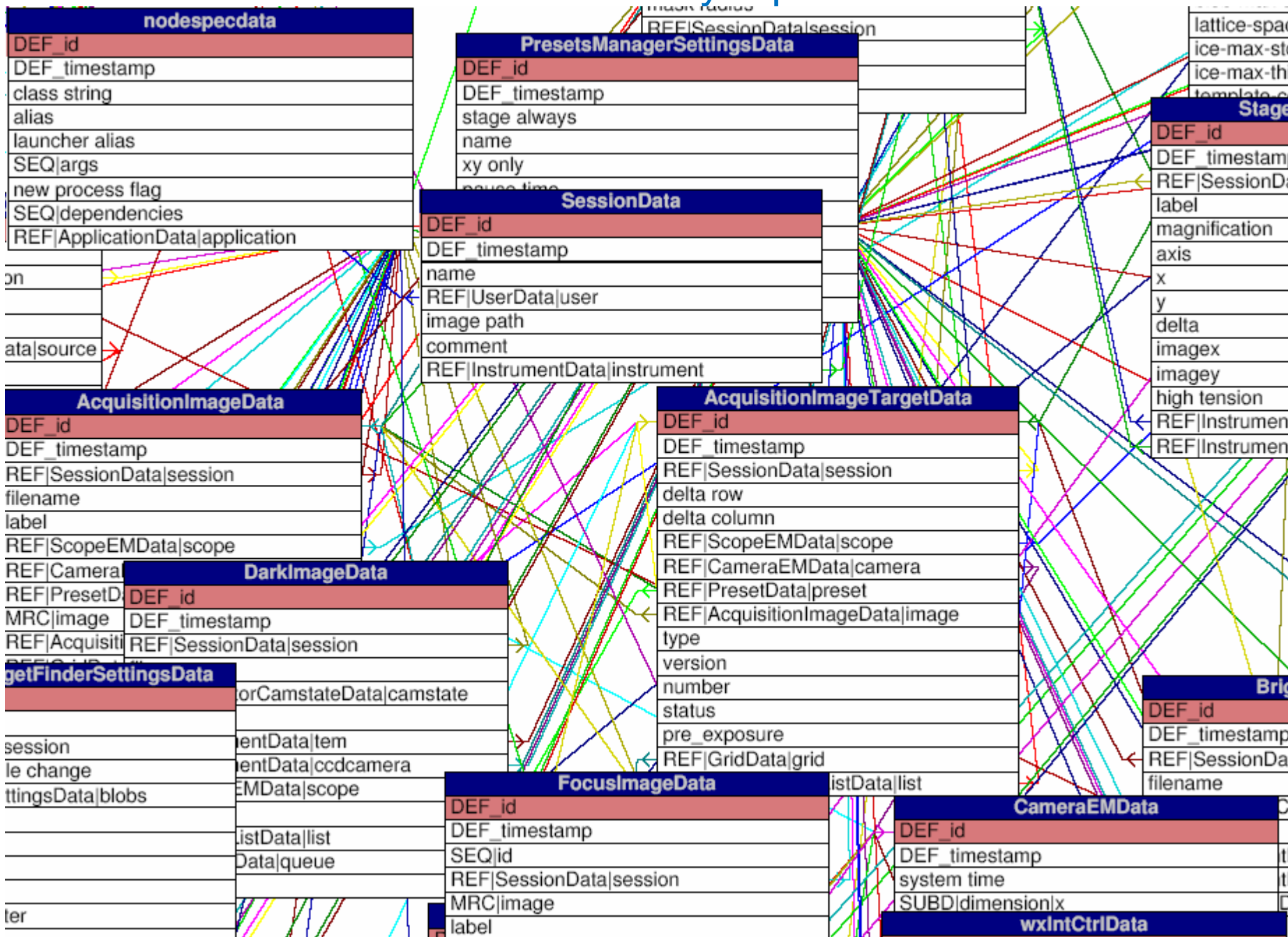
ObjectFinderSettingsData	
REF ObjectFinderSettingsData camstate	
session	
file change	
settingsData blobs	

FocusImageData	
DEF_id	
DEF_timestamp	
SEQ id	
REF SessionData session	
MRC image	
label	

CameraEMData	
DEF_id	
DEF_timestamp	
system time	
SUBD dimension x	

BrightfieldSettingsData	
DEF_id	
DEF_timestamp	
REF SessionData session	
filename	

ter	
-----	--

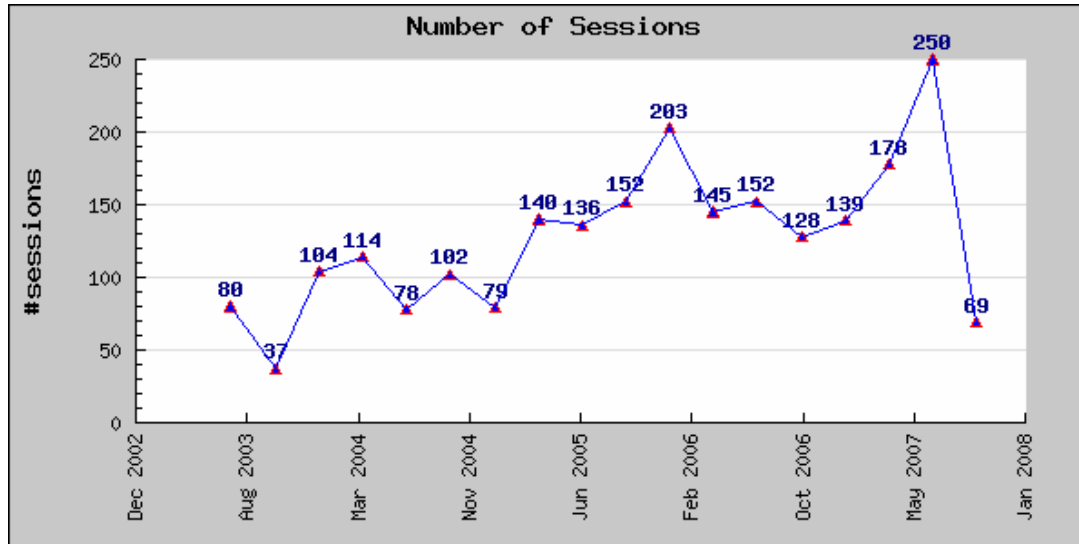
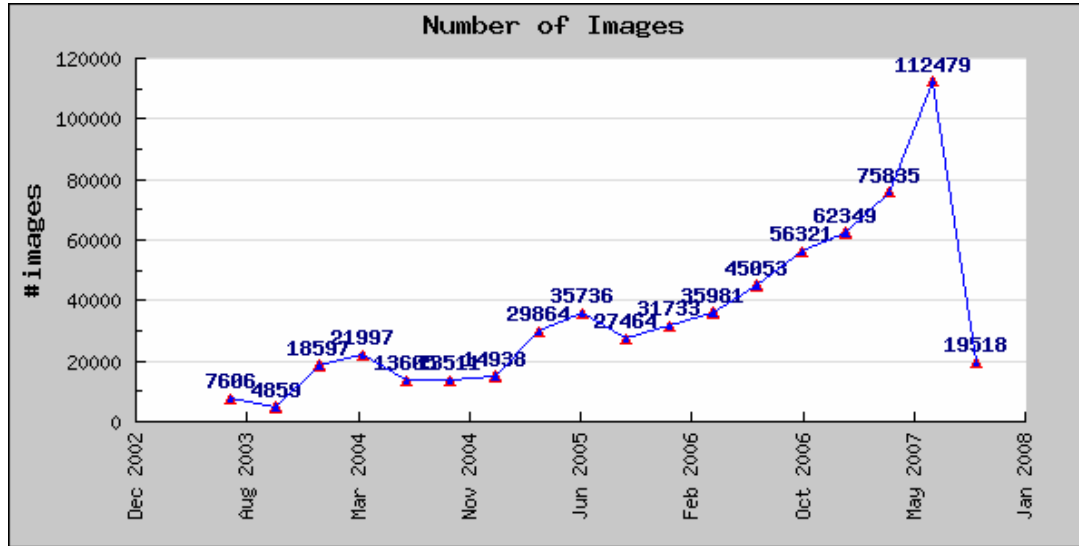


Database in 2007

Image records: **594,506**
Experiment records: **2891**
Experiment Size: **15,082,558,053 kB**

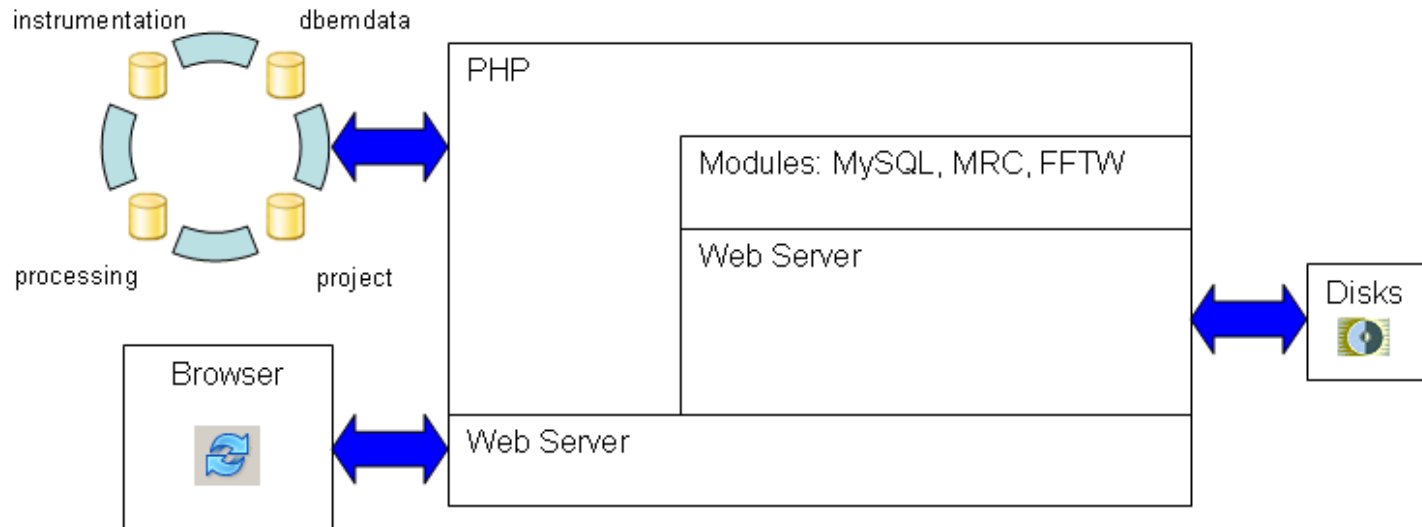
	Total Cell	Tables	Data	Indexes	Total	
dbemdata	162,355,637	183	905.3 MB	651.4 MB	1.5	GB
processing	663,741,994	50	3.2 GB	2.9 GB	6.2	GB

Database in 2007

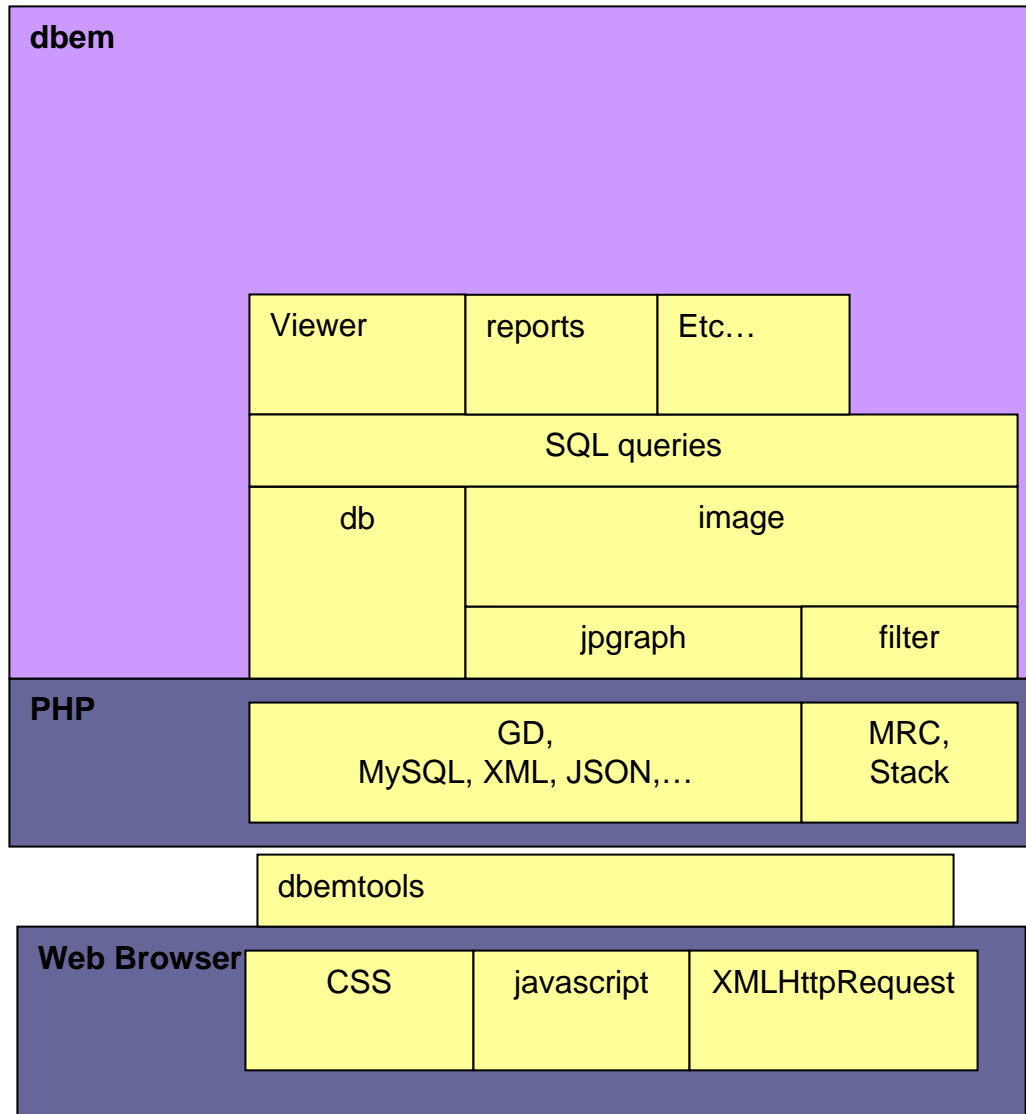


Web based principle

- **L**inux
- **A**pache
- **M**ySQL
- **P**HP/Python



Web based principle



Demo