

Minimum intrusion Grid



Tutorial

M I N I M U M I N T R U S I O N G R I D

The desired user view of MiG

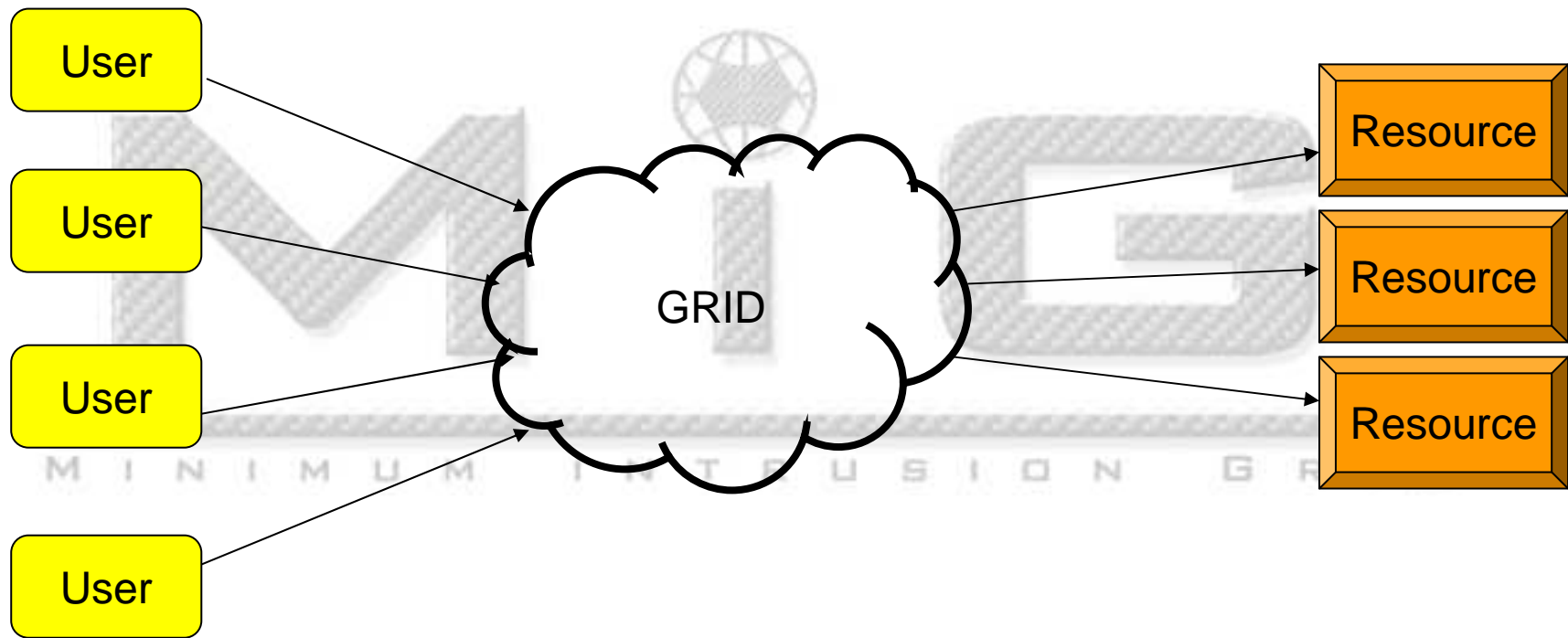
- MiG should be a virtual computer to the user
- Files are stored within MiG – each user has his own home-directory
 - In job descriptions files are relative to the users home-directory
- Not yet interactive application support

The desired resource view of MiG

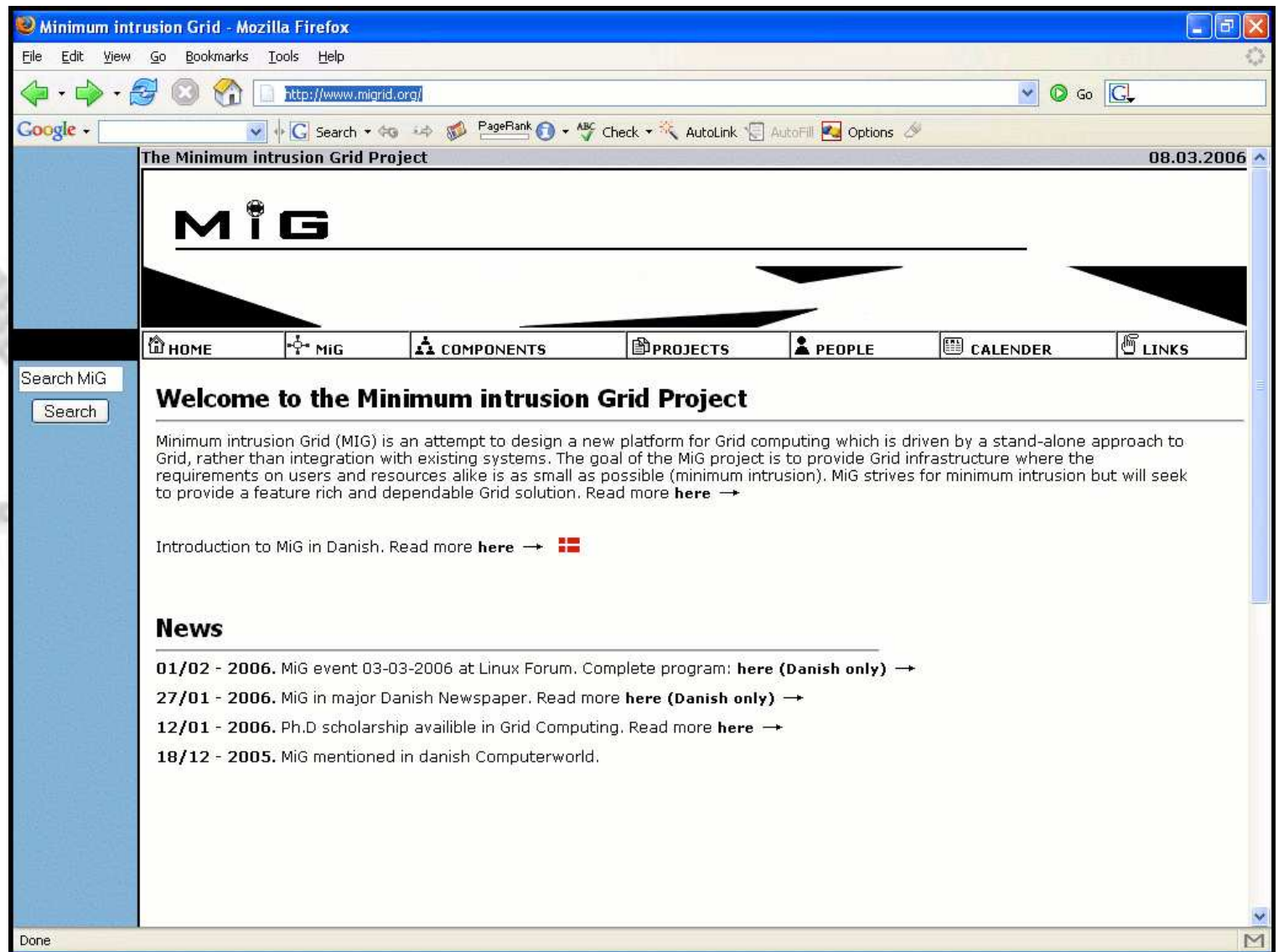
- MiG is just another user
 - or set of users
- Economically MiG should be fair



The abstract MiG model



Front page



The screenshot shows a Mozilla Firefox browser window displaying the front page of the Minimum intrusion Grid Project. The browser's address bar shows the URL <http://www.migrid.org/>. The page title is "The Minimum intrusion Grid Project" and the date "08.03.2006" is displayed in the top right corner. The main content area features the "MIG" logo, a navigation menu with links for HOME, MiG, COMPONENTS, PROJECTS, PEOPLE, CALENDER, and LINKS, and a search box labeled "Search MiG". The main heading is "Welcome to the Minimum intrusion Grid Project". The introductory text states: "Minimum intrusion Grid (MIG) is an attempt to design a new platform for Grid computing which is driven by a stand-alone approach to Grid, rather than integration with existing systems. The goal of the MiG project is to provide Grid infrastructure where the requirements on users and resources alike is as small as possible (minimum intrusion). MiG strives for minimum intrusion but will seek to provide a feature rich and dependable Grid solution. Read more [here](#) →". Below this, there is a link for "Introduction to MiG in Danish. Read more [here](#) →" with a Danish flag icon. The "News" section lists several updates: "01/02 - 2006. MiG event 03-03-2006 at Linux Forum. Complete program: [here \(Danish only\)](#) →", "27/01 - 2006. MiG in major Danish Newspaper. Read more [here \(Danish only\)](#) →", "12/01 - 2006. Ph.D scholarship available in Grid Computing. Read more [here](#) →", and "18/12 - 2005. MiG mentioned in danish Computerworld." The browser's status bar at the bottom shows "Done".

Minimum intrusion Grid - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

<http://www.migrid.org/>

Google Search PageRank Check AutoLink AutoFill Options

The Minimum intrusion Grid Project 08.03.2006


MIG

HOME MiG COMPONENTS PROJECTS PEOPLE CALENDER LINKS

Search MiG
Search

Welcome to the Minimum intrusion Grid Project

Minimum intrusion Grid (MIG) is an attempt to design a new platform for Grid computing which is driven by a stand-alone approach to Grid, rather than integration with existing systems. The goal of the MiG project is to provide Grid infrastructure where the requirements on users and resources alike is as small as possible (minimum intrusion). MiG strives for minimum intrusion but will seek to provide a feature rich and dependable Grid solution. Read more [here](#) →

Introduction to MiG in Danish. Read more [here](#) → 

News

01/02 - 2006. MiG event 03-03-2006 at Linux Forum. Complete program: [here \(Danish only\)](#) →

27/01 - 2006. MiG in major Danish Newspaper. Read more [here \(Danish only\)](#) →

12/01 - 2006. Ph.D scholarship available in Grid Computing. Read more [here](#) →

18/12 - 2005. MiG mentioned in danish Computerworld.

Done

Components



Minimum intrusion Grid - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://mig-2.imada.sdu.dk:8092/MiG/MiG/Components/MiG_Components.html

Google Search PageRank Check AutoLink AutoFill Options

The Minimum intrusion Grid Project 08.03.2006

MiG

HOME MiG COMPONENTS PROJECTS PEOPLE CALENDER LINKS

Search MiG
Search

MiG Components

MiG Monitor

This component manages jobs, resources and the server status. It is publicly available [here](#) →

MiG job submission page

Submitting jobs to the MiG system can be done [here](#) →
Requires a MiG certificate, see below.

MiG certificate generation request

If you think you are entitled to have a MiG certificate you can fill in your details at the [certificate generation request page](#) →

Done

Certificate

Certificate:

Data:

Version: 3 (0x2)

Serial Number: 2 (0x2)

Signature Algorithm: md5WithRSAEncryption

Issuer: C=DK, ST=Denmark, O=IMADA, OU=MiG, CN=MiGCA

Validity

Not Before: Oct 8 12:02:56 2004 GMT

Not After : Oct 8 12:02:56 2005 GMT

Subject: C=DK, ST=Denmark, L=IMADA, O=MiG, CN=Brian Vinter

Subject Public Key Info:

Public Key Algorithm: rsaEncryption

RSA Public Key: (1024 bit)

Modulus (1024 bit):

00:d8:86:49:c5:3d:5a:05:32:c4:43:ec:78:64:88:

[snip]

Exponent: 65537 (0x10001)

X509v3 extensions:

X509v3 Basic Constraints:

CA:FALSE

Netscape Comment:

OpenSSL Generated Certificate

X509v3 Subject Key Identifier:

AC:12:72:6F:0B:EC:4D:38:6B:3E:C2:30:46:10:FD:C2:2A:E1:D1:D6

X509v3 Authority Key Identifier:

keyid:FA:74:8F:4C:1D:2B:9A:14:AC:93:D7:41:55:E3:01:BC:4C:ED:2B:87

DirName:/C=DK/ST=Denmark/O=IMADA/OU=MiG/CN=MiGCA

serial:00

Signature Algorithm: md5WithRSAEncryption

1e:47:53:0f:3f:75:e0:ce:e7:c0:18:8f:94:a0:0d:39:d6:37:

e9:bd:96:aa:43:7c:7b:a1:db:4a:54:cd:36:82:ff:2d:71:cb:

91:db:fc:b2:f2:1f:0f:37:a4:b5:0c:6b:cf:55:4d:23:cc:a3:

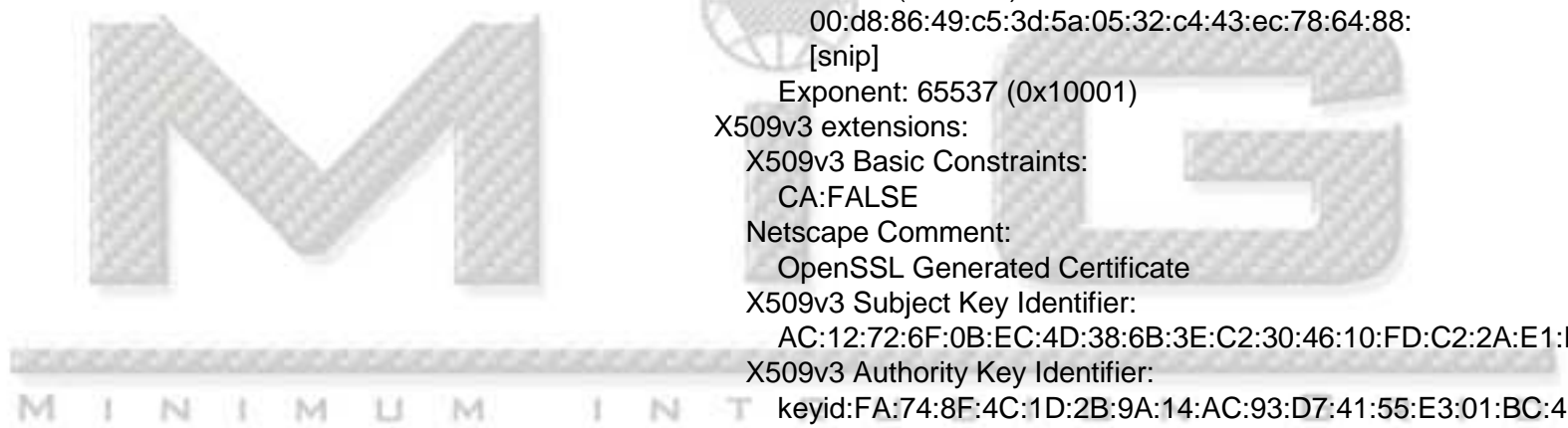
f1:f0:f9:9a:4e:57:26:26:c7:de:0f:49:4d:28:3a:6b:bb:00:

6b:16:c4:e3:10:ef:b7:b8:c9:6d:1a:d1:63:d4:6d:58:d6:9d:

9f:3f:47:aa:b3:3b:3f:b4:79:38:c6:9d:53:67:51:80:ce:

c5:2c:23:07:b5:39:47:15:b3:b9:25:5e:9b:40:44:bb:29:31:

21:93



Obtaining a certificate

Mozilla Firefox window: MiG certificate request - Mozilla Firefox

Address bar: https://mig-1.imada.sdu.dk:8092/cgi-bin/requestcert_html.py

Google Search

MiG

MINIMUM INTRUSION GRID

Welcome to the MiG certificate generation request page.

Please enter your data below. Pressing the Submit button sends a certificate generation request email to the MiG administrators.

Name: (please avoid special and accented chars)

Two letter country-code: (GB/DK/.. , [help](#))

Organization:

State:

Email:

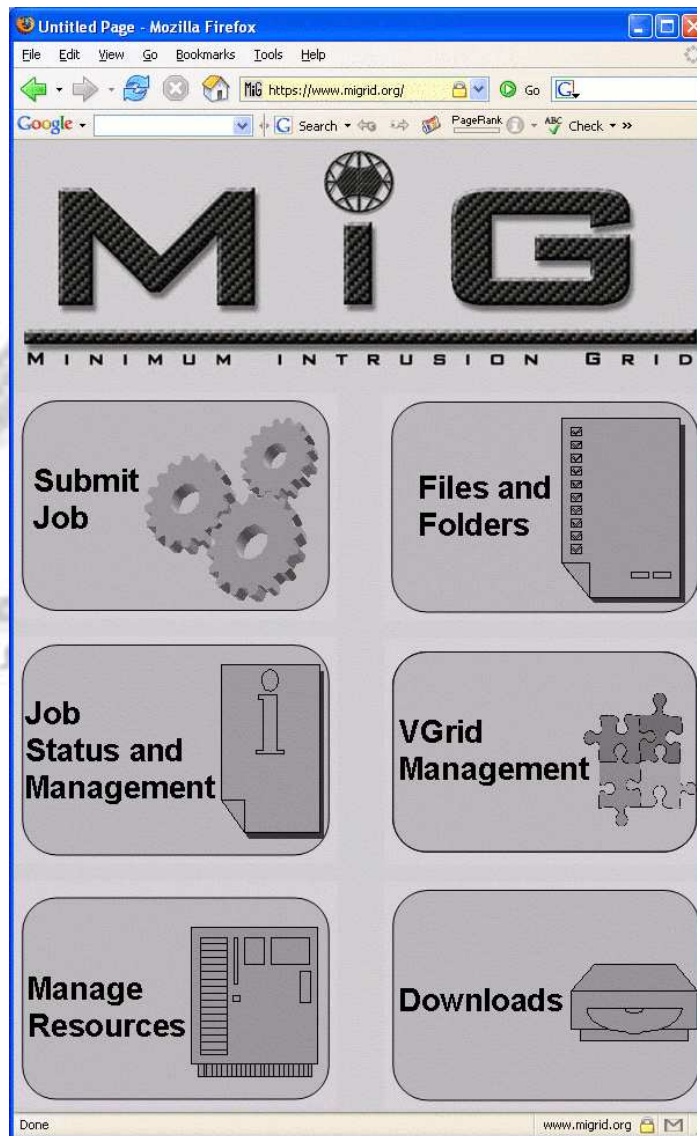
Password: (can be read by MiG administrators in clear text!)

Verify password:

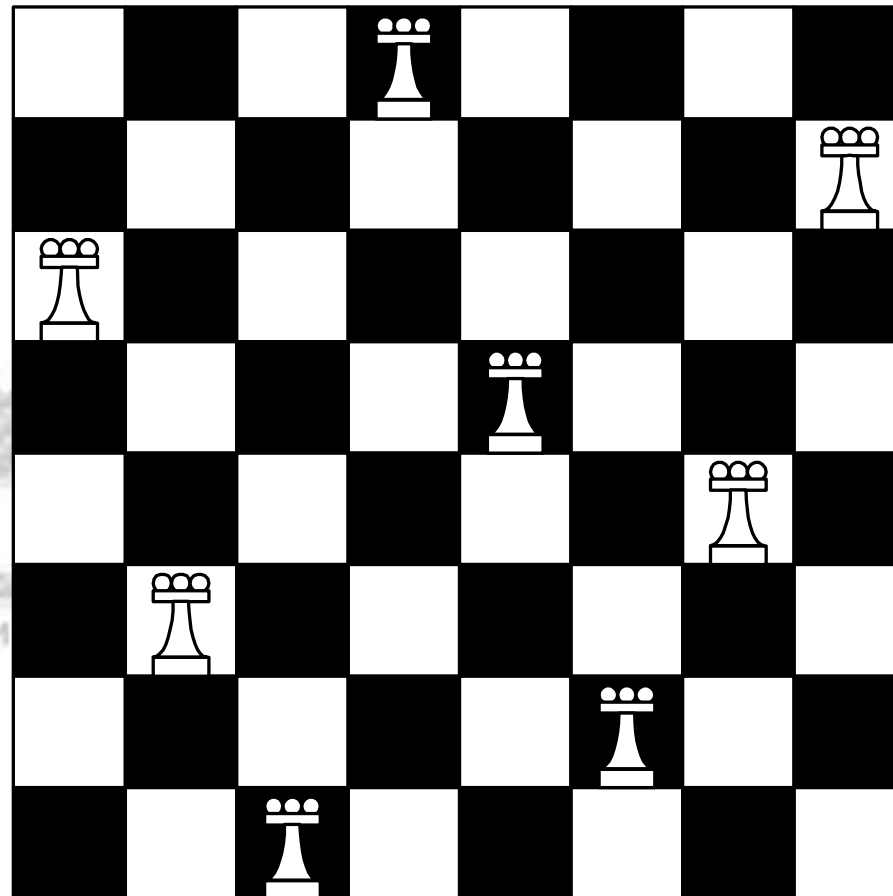
Comment or reason why you should have a cert:

Done mig-1.imada.sdu.dk:8092

Getting Started



Your first job (Problem)



MINIM GRID

Your first job (code)

```
class Queens {  
  
    public int n=8;  
    public int count = 0;  
    int [] all;
```

```
    boolean legal(int i){  
        for(int x=0;x<i;x++){  
            if(all[i]==all[x])return(false);  
            if(all[x]-(i-x)==all[i])return(false);  
            if(all[x]+(i-x)==all[i])return(false);  
        }  
        return(true);  
    }  
}
```

```
    Queens(int n){  
        this.n=n;  
        all=new int[n];  
        make_boards(0);  
    }  
}
```

```
public class Nqueens_seq {  
    public static void main(String args[]){  
        int n=8;  
        if(args.length>0)n=new Integer(args[0]).intValue();  
        System.out.println(new Queens(n).count+" with "+n+" queens");  
    }  
}  
  
    void make_boards(int i){  
        for(int y=0;y<n;y++){  
            all[i]=y;  
            if(legal(i)){  
                if(i+1==n)count++;  
                else make_boards(i+1);  
            }  
        }  
    }
```

Your first job (job)

```
::EXECUTE::
```

```
java Nqueens_seq 15
```

```
::NOTIFY::
```

```
jabber: vinter@jabber.dk
```

```
::INPUTFILES::
```

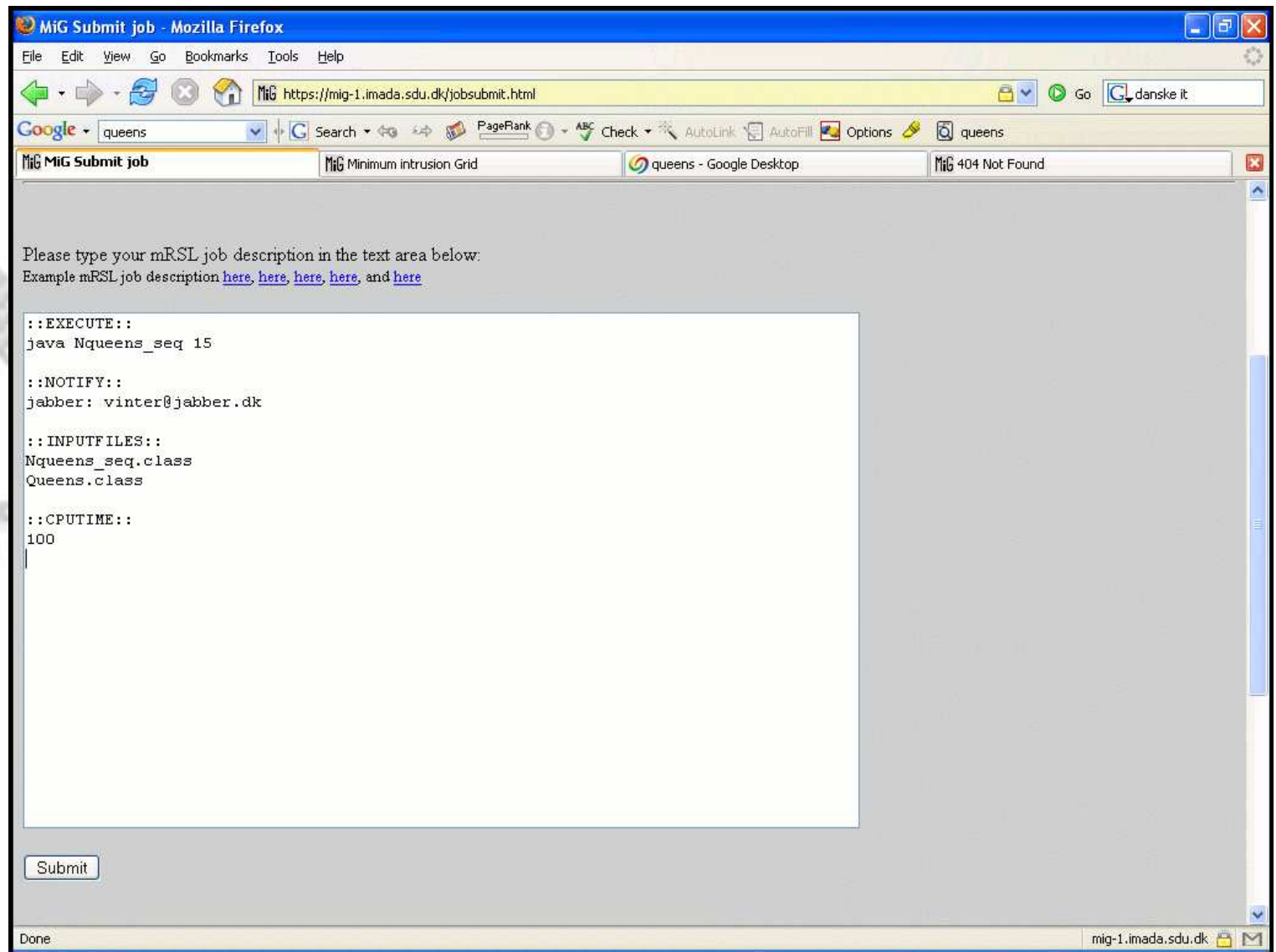
```
Nqueens_seq.class
```

```
Queens.class
```

```
::CPUTIME::
```

```
100
```

Your first job (submit)



MIG Submit job - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

Go

Google Search PageRank Check AutoLink AutoFill Options queens

MIG MIG Submit job MIG Minimum intrusion Grid queens - Google Desktop MIG 404 Not Found

Please type your mRSL job description in the text area below:
Example mRSL job description [here](#), [here](#), [here](#), [here](#), and [here](#)

```
::EXECUTE::  
java Nqueens_seq 15  
  
::NOTIFY::  
jabber: vinter@jabber.dk  
  
::INPUTFILES::  
Nqueens_seq.class  
Queens.class  
  
::CPUTIME::  
100
```

Done mig-1.imada.sdu.dk

Your first job (completed)

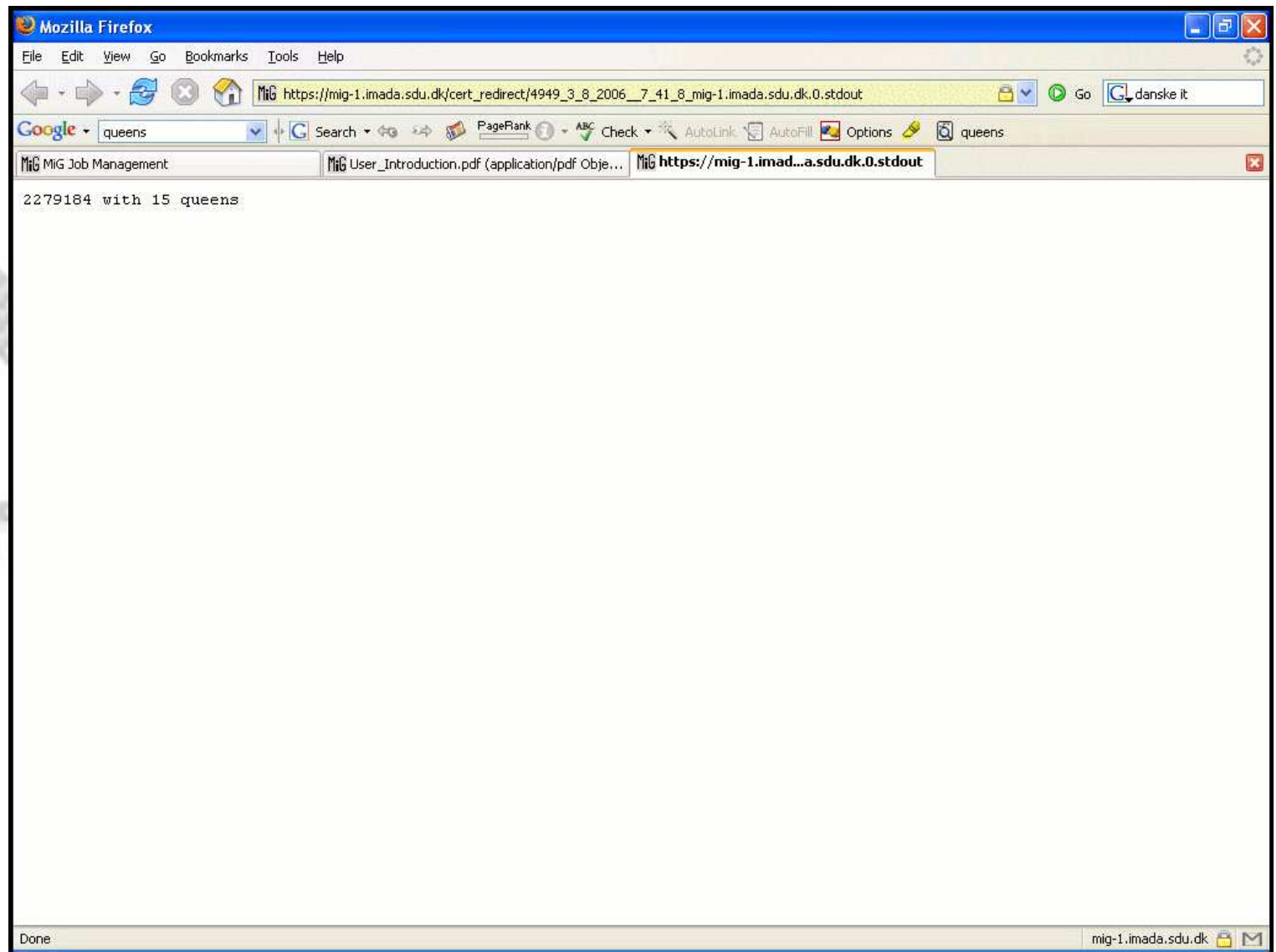


The screenshot shows a BitBee chat window titled "mig_daemon@jabbernet.dk". The chat history contains the following messages:

```
[08:35:42] **** mig_daemon@jabbernet.dk is Offline
[08:35:38] < mig_daemon@jabbernet.dk > MiG JOB finished: Your MiG job
with JOB ID 4948_3_8_2006__7_35_22_mig-1.imada.sdu.dk.0 has
finished. Outputfiles can be found here:
https://mig-1.imada.sdu.dk/cgi-bin/myfiles.py?with\_html=true
[08:35:38] < mig_daemon@jabbernet.dk > The commands and exit codes:
[08:35:38] < mig_daemon@jabbernet.dk > java Nqueens_seq 15 0
[08:35:39] < mig_daemon@jabbernet.dk > Link to stdout file:
https://mig-1.imada.sdu.dk/cert\_redirect/4948\_3\_8\_2006\_\_7\_35\_22\_mig-1.imada.sdu.dk.0.stdout (might not be available)
[08:35:39] < mig_daemon@jabbernet.dk > Link to stderr file:
https://mig-1.imada.sdu.dk/cert\_redirect/4948\_3\_8\_2006\_\_7\_35\_22\_mig-1.imada.sdu.dk.0.stderr (might not be available)
[08:35:39] < mig_daemon@jabbernet.dk > Replies to this message will not be
read!
```

The chat window also shows a search bar with "mig_daemon@jabbernet.dk/BitBee" and a "Vinter" button. The bottom of the window features a toolbar with icons for smiley, home, lock, messages, and a help icon, along with a text input field.

Your first job (result)



Your first job (result)

 2279184 with 15 queens

M I N I M U M I N T R U S I O N G R I D

mRSL job specification

- Globus RSL and Nordugrid xRSL too
- complex.
- - Most keywords are similar to those in
- RSL/xRSL:
 - EXECUTE , INPUTFILES , OUTPUTFILES ,
EXECUTABLES , CPUTIME , MEMORY ,
DISK , RUNTIMEENVIRONMENT , JOBNAME ,
NOTIFY , ARCHITECTURE , ENVIRONMENT ,
CPUCOUNT , NODECOUNT , MAXPRICE

mRSL example

```
::EXECUTE::
echo "Hello World"
uname -a
cat inputfile >>
outfile
::NOTIFY::
jabber:
karlsen@jabbernet.dk
::INPUTFILES::
inputfile
::OUTPUTFILES::
outfile
::MEMORY::
128
::DISK::
10
::MAXPRICE::
30
::CPUTIME::
1000
::JOBNAME::
myjobname
```

mRSL example

```
::EXECUTE::
echo "Hello World"
uname -a
cat inputfile >>
outfile
::NOTIFY::
jabber:
karlsen@jabbernet.dk
::INPUTFILES::
inputfile
::OUTPUTFILES::
outfile
::MEMORY::
128
::DISK::
10
::MAXPRICE::
30
::CPUTIME::
1000
::JOBNAME::
myjobname
```

MiG from the users POV

- Browser
 - x.509 certificate and HTTPS
- Manage files in grid home directory
- Submit jobs, view jobstatus etc.
- MiGscripts. Wrappers around “curl”.
- File handling:
 - MiGput, MiGget, MiGremove, MiGlist, MiGcat
- Job handling:
 - MiGsubmit, MiGstatus, MiGallstatus, MiGkill

Using the scripts

Download job specification (mRSL file):

`http://mig-1.imada.sdu.dk/example4.mRSL`

This example creates and uploads 'inputfile' which is used for outputfile

Run the job:

```
echo "test job" > inputfile
```

```
MiGput.sh inputfile inputfile
```

```
MiGsubmit.sh example4.mRSL
```

returns a job_id that is used for further treatment of the job

the job creates a file (outputfile)

```
MiGstatus.sh job_id
```

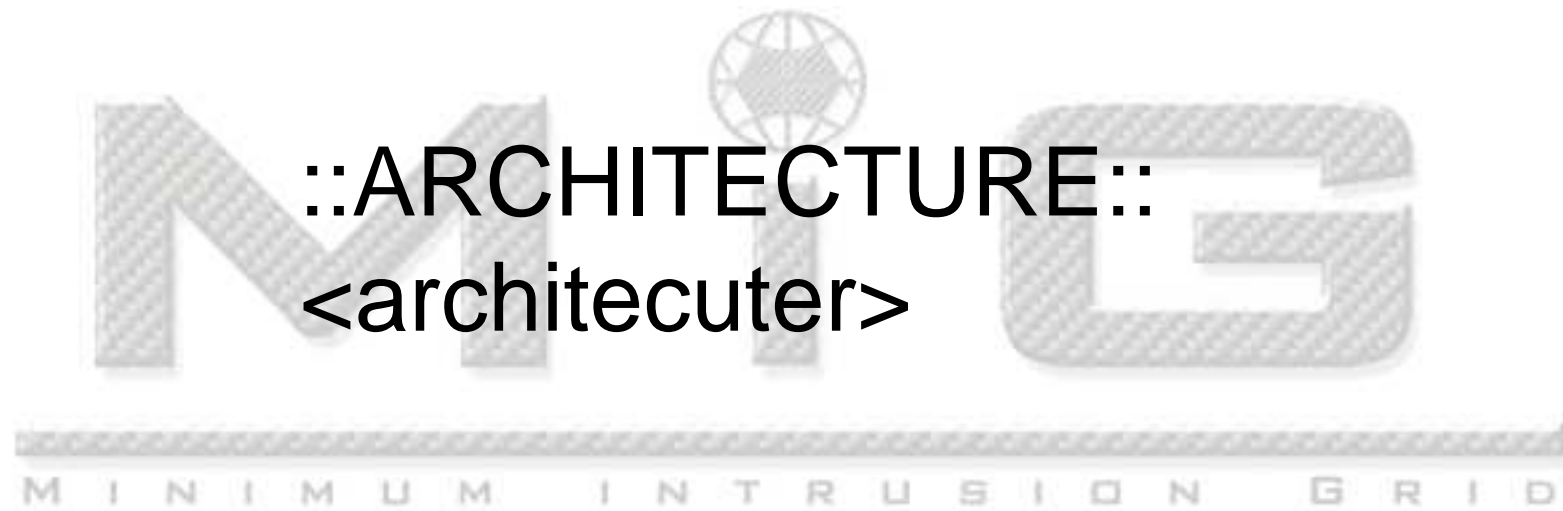
to get the status of the job

```
MiGcat.sh outputfile
```

to show the job output when job is done

Further examples at <https://mig-1.imada.sdu.dk/>

Getting to run on a special architecture



Available Architectures

- i386
- X86
- IA64
- AMD64
- Itanium
- SPARC
- SPARC64
- SUN4U
- SPARC-T1



To get to the T2000

- USE

::ARCHITECTURE::
SPARC-T1

