# BlueQuartz Development in Deep

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Project BlueQuartz
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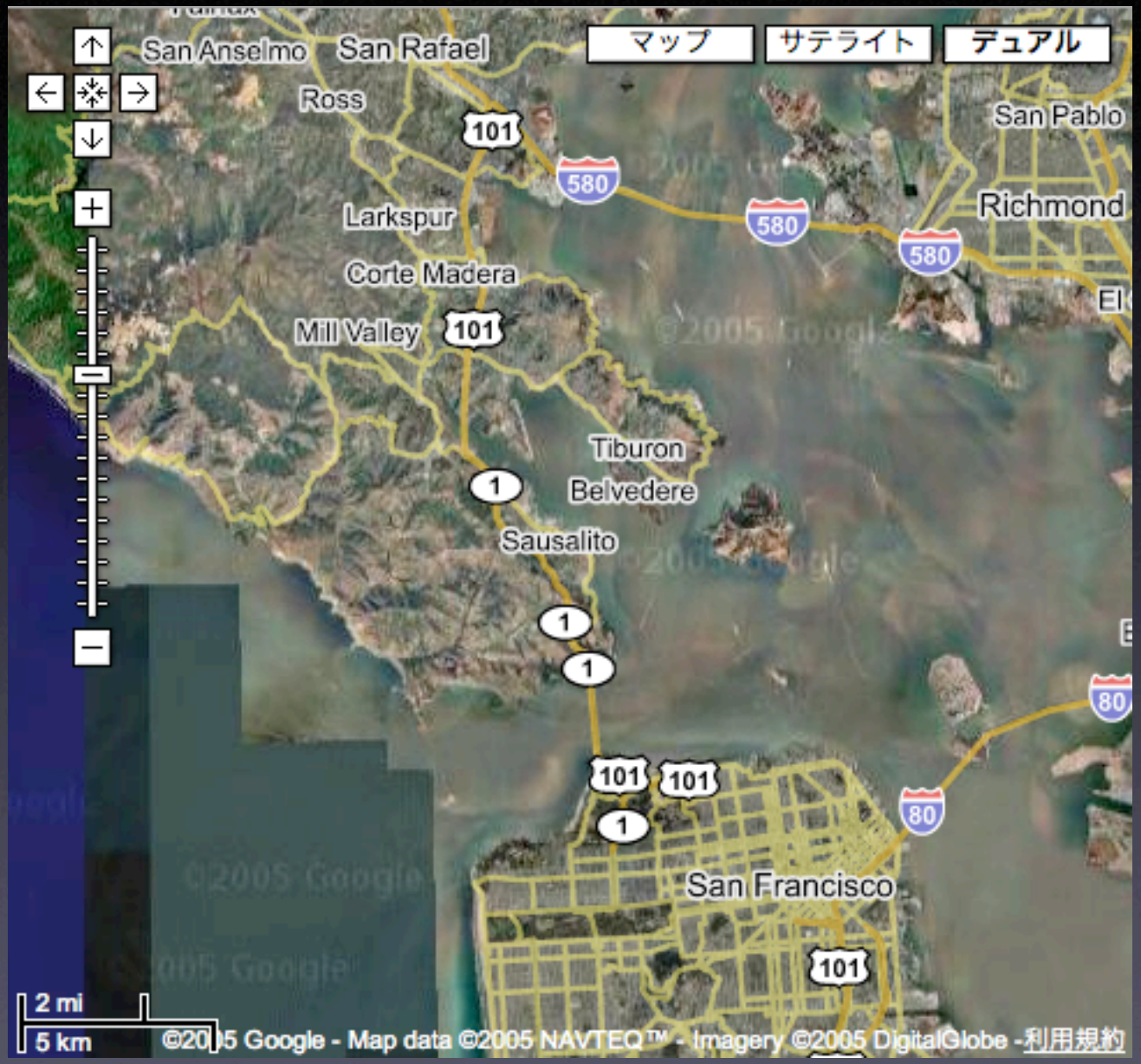
# What is Sausalito?

- Cobalt Qube3/RaQ550のGUI
  - RaQXTRの一部にも使われている
    が・・・
    RaQXTRは(RaQ4+Qube3)/2という感じ
- BlueQuartzのcore

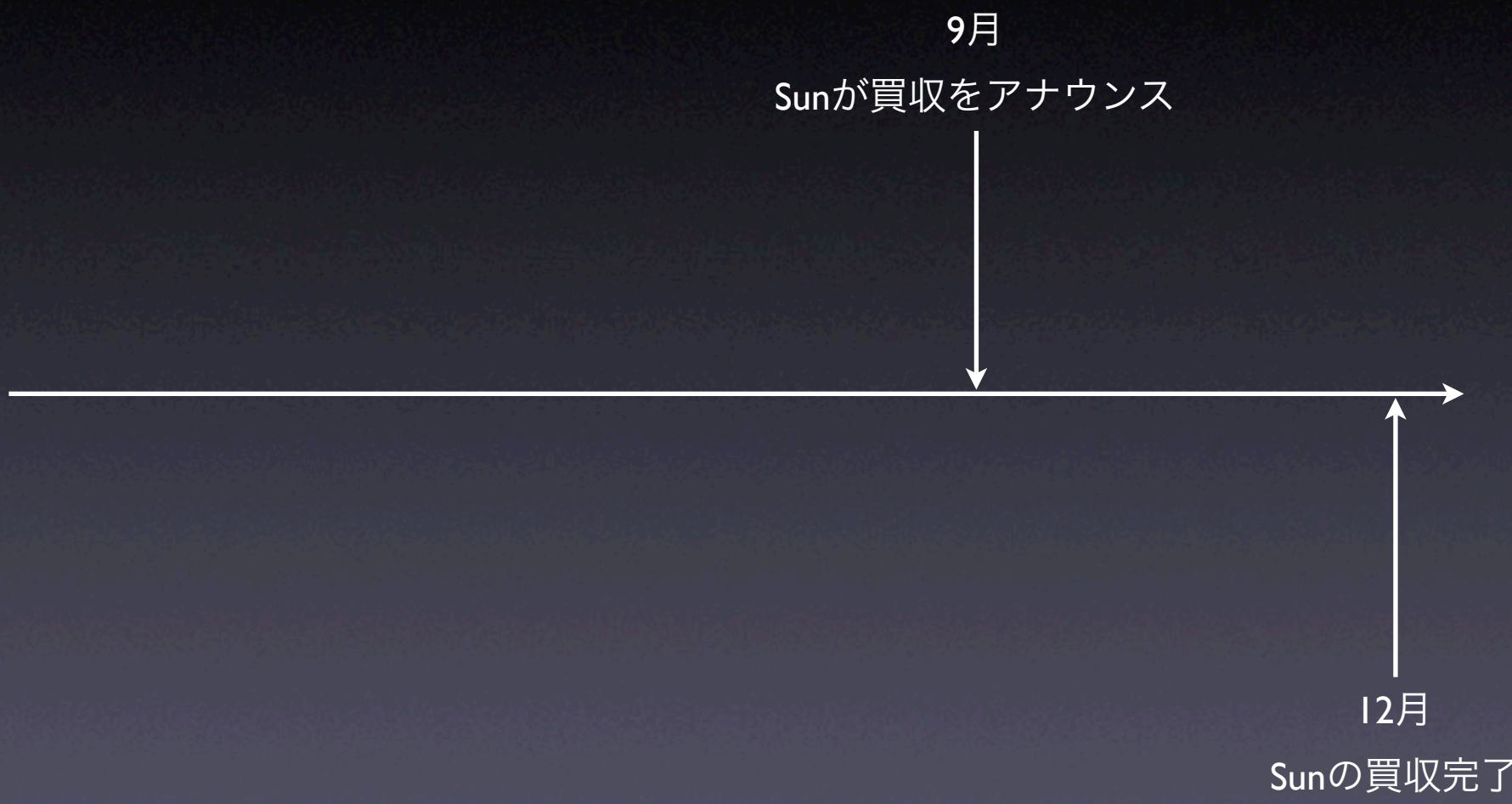
おなじみの・・・

# Where is Sausalito?

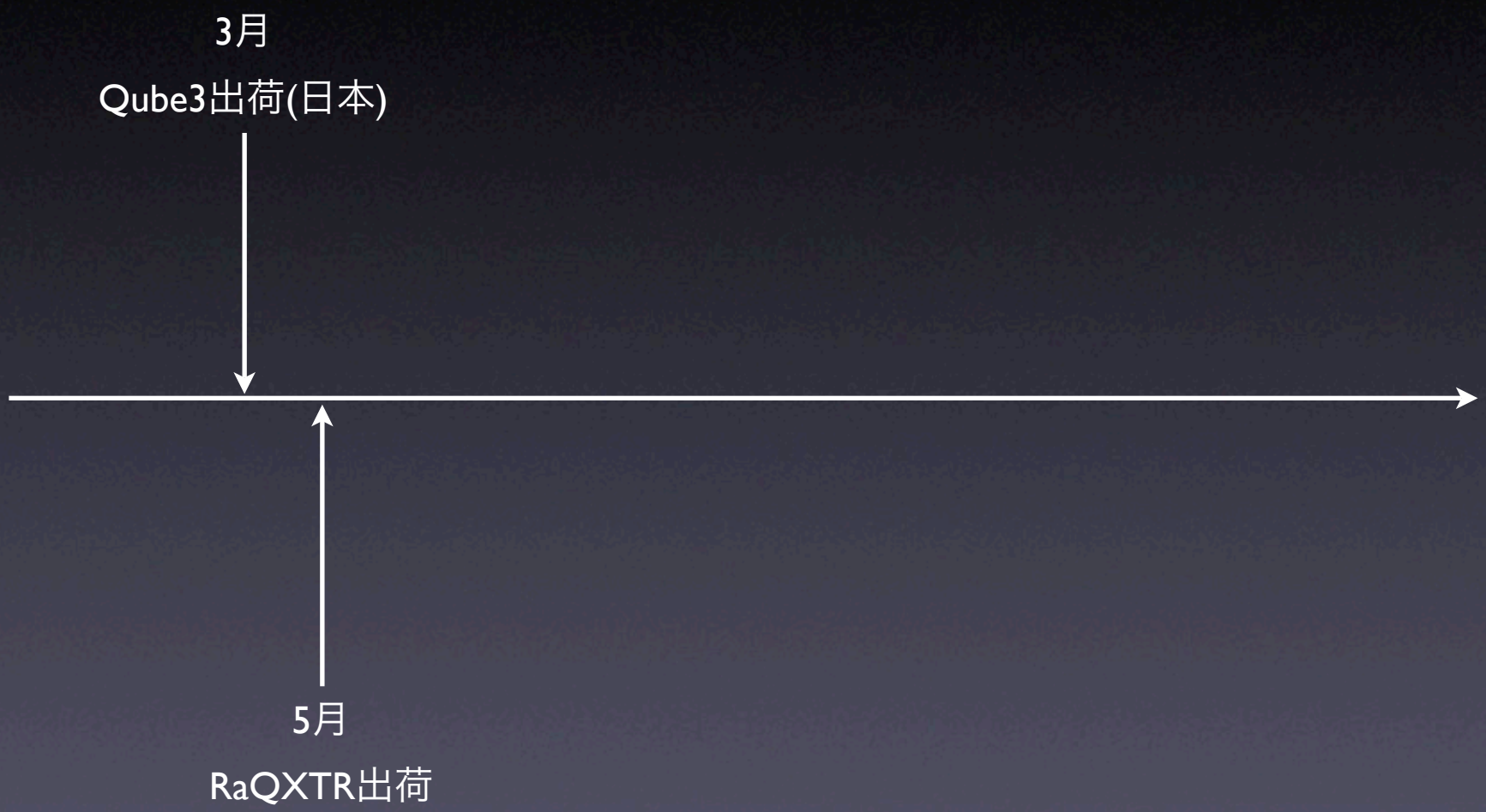



Go http://www.ci.sausalito.ca.us/

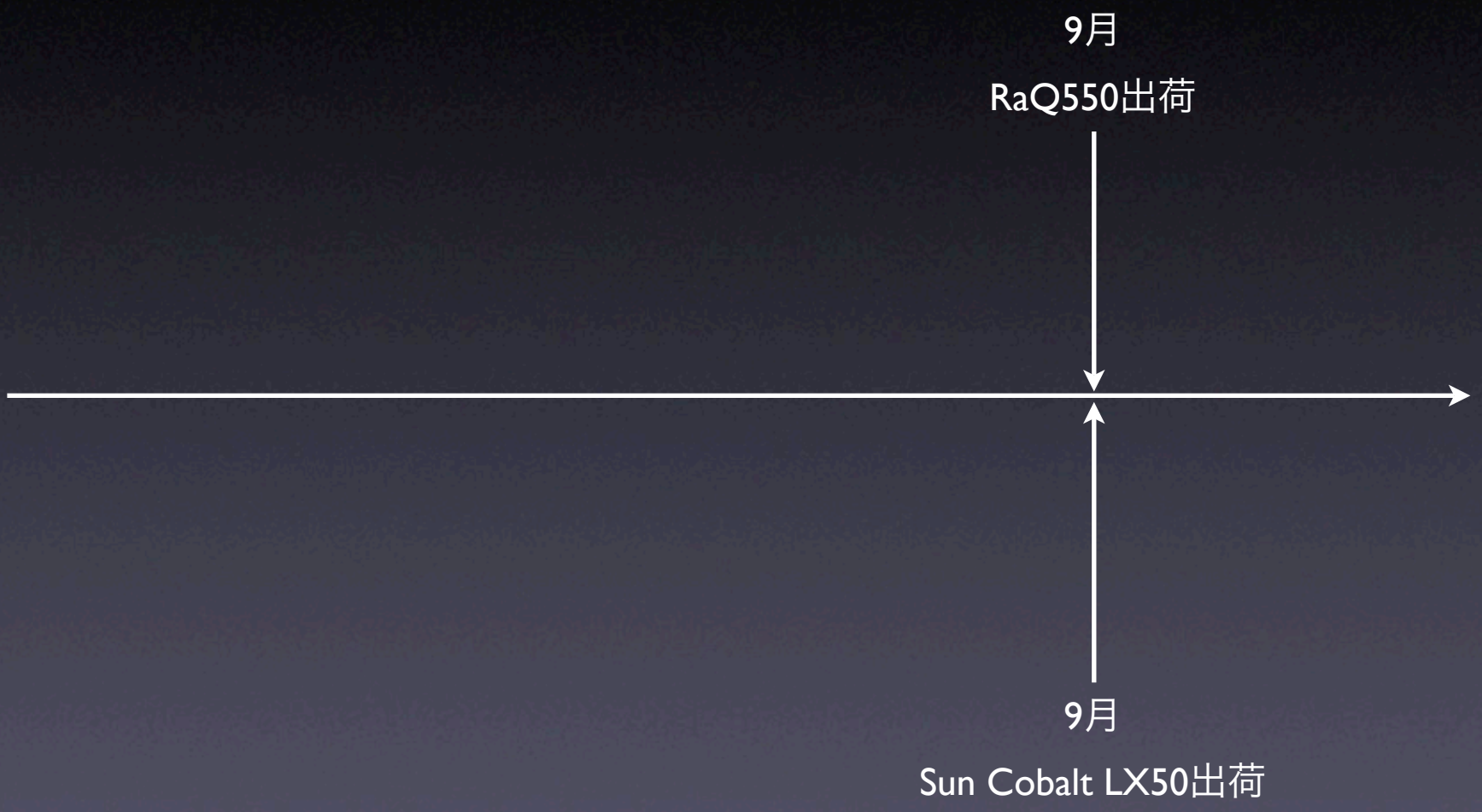
# CobaltからProject BlueQuartzへ



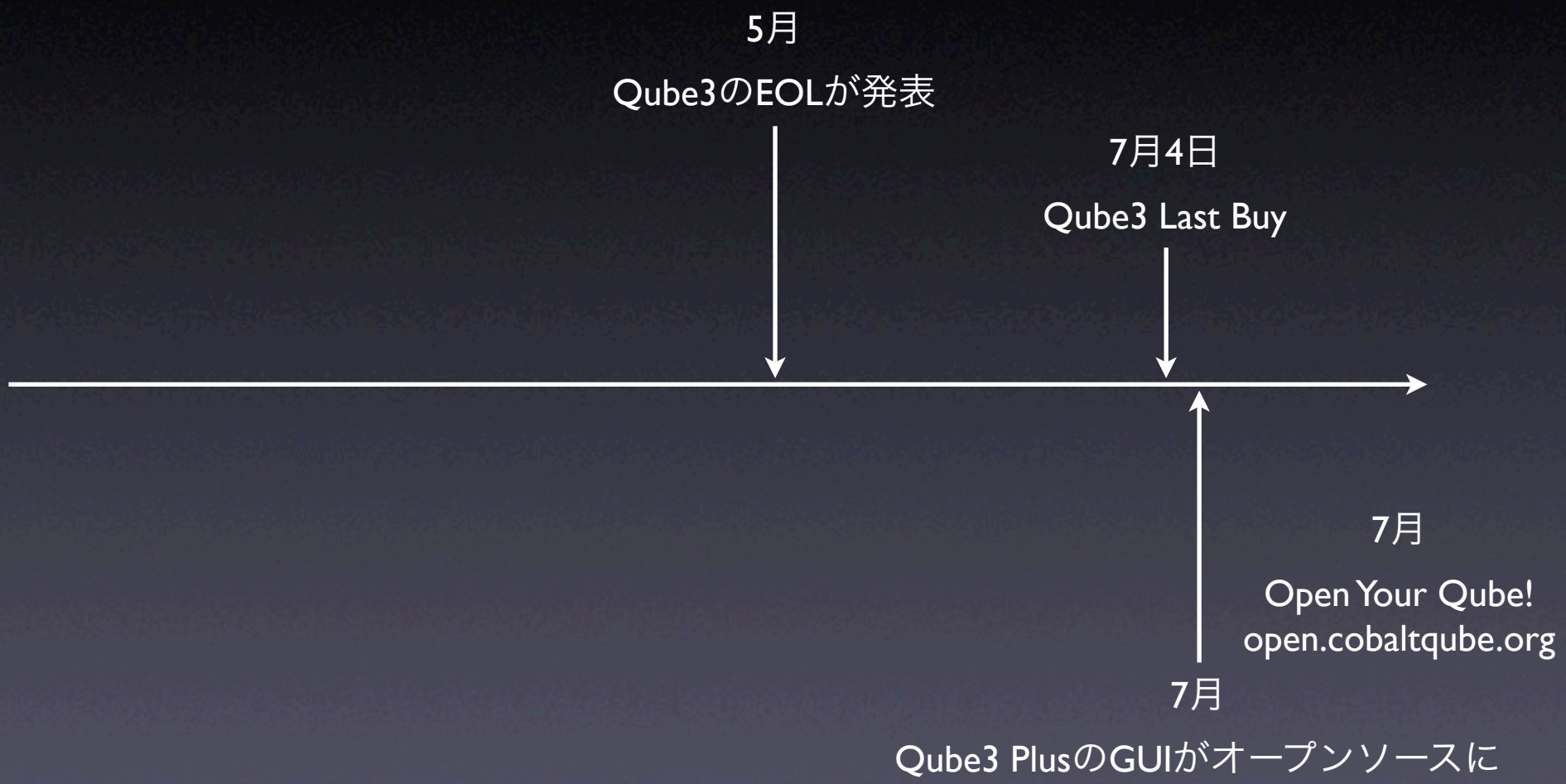
# CobaltからProject BlueQuartzへ



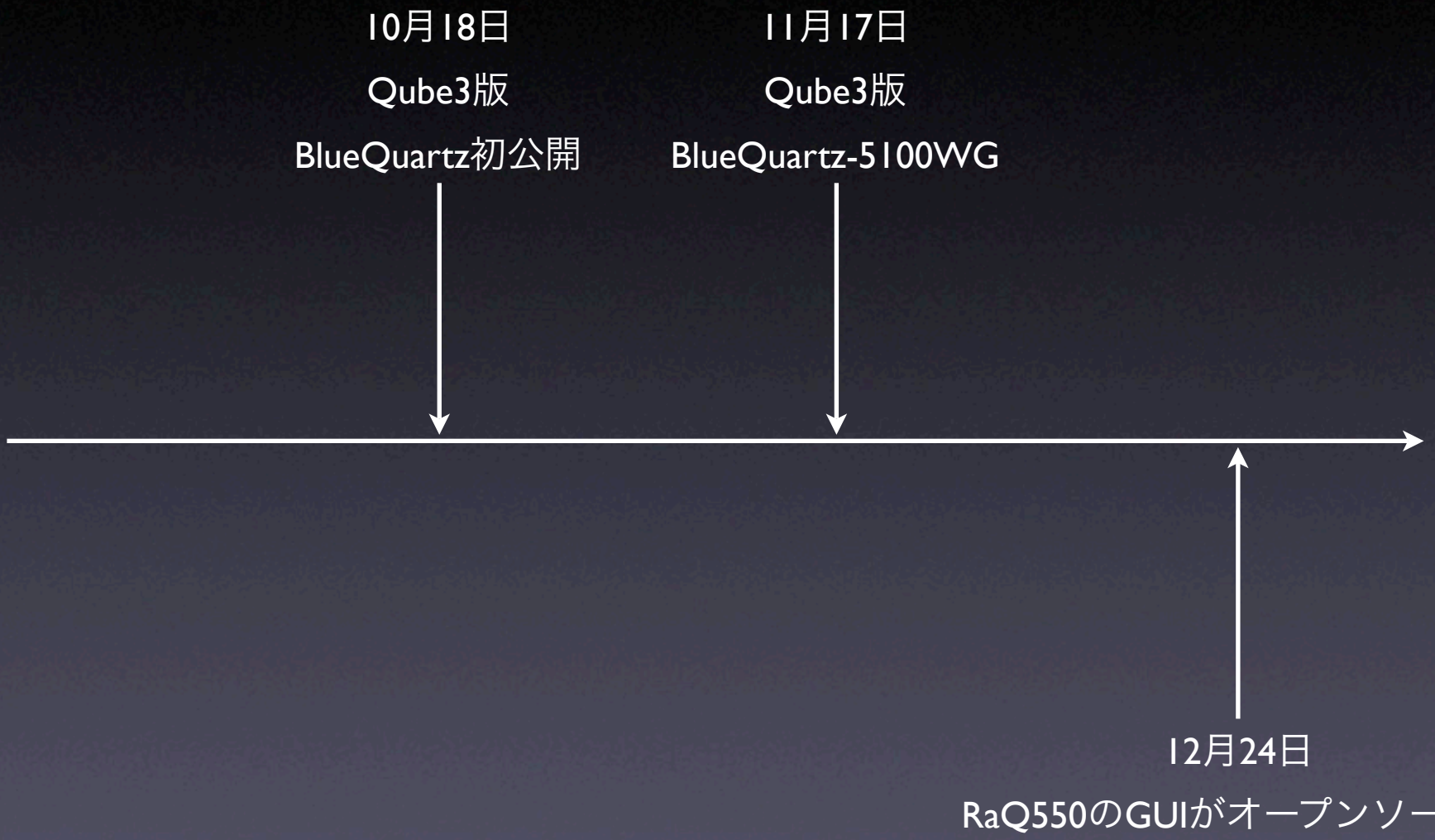
# CobaltからProject BlueQuartzへ



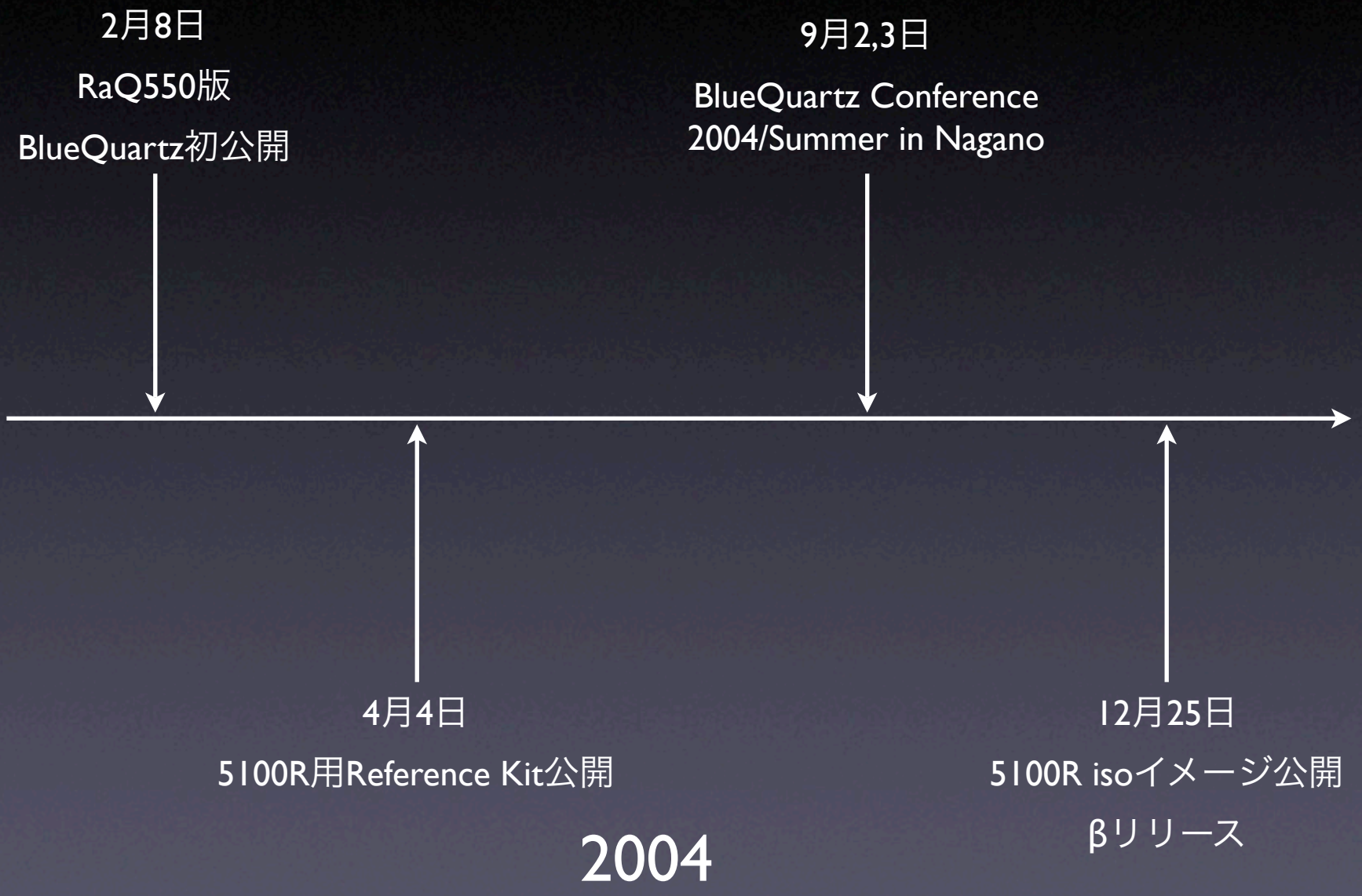
# CobaltからProject BlueQuartzへ



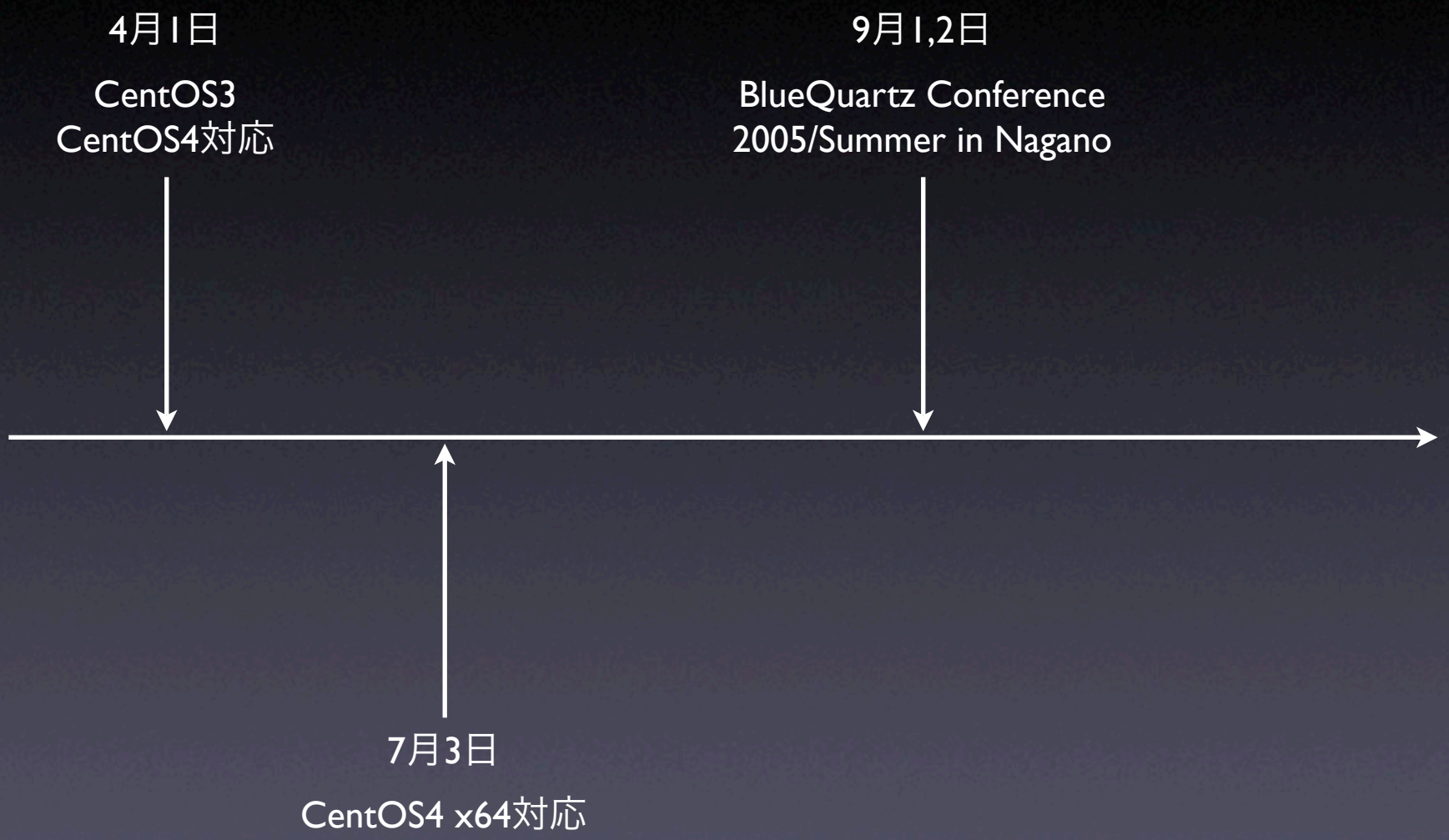
# CobaltからProject BlueQuartzへ



# CobaltからProject BlueQuartzへ

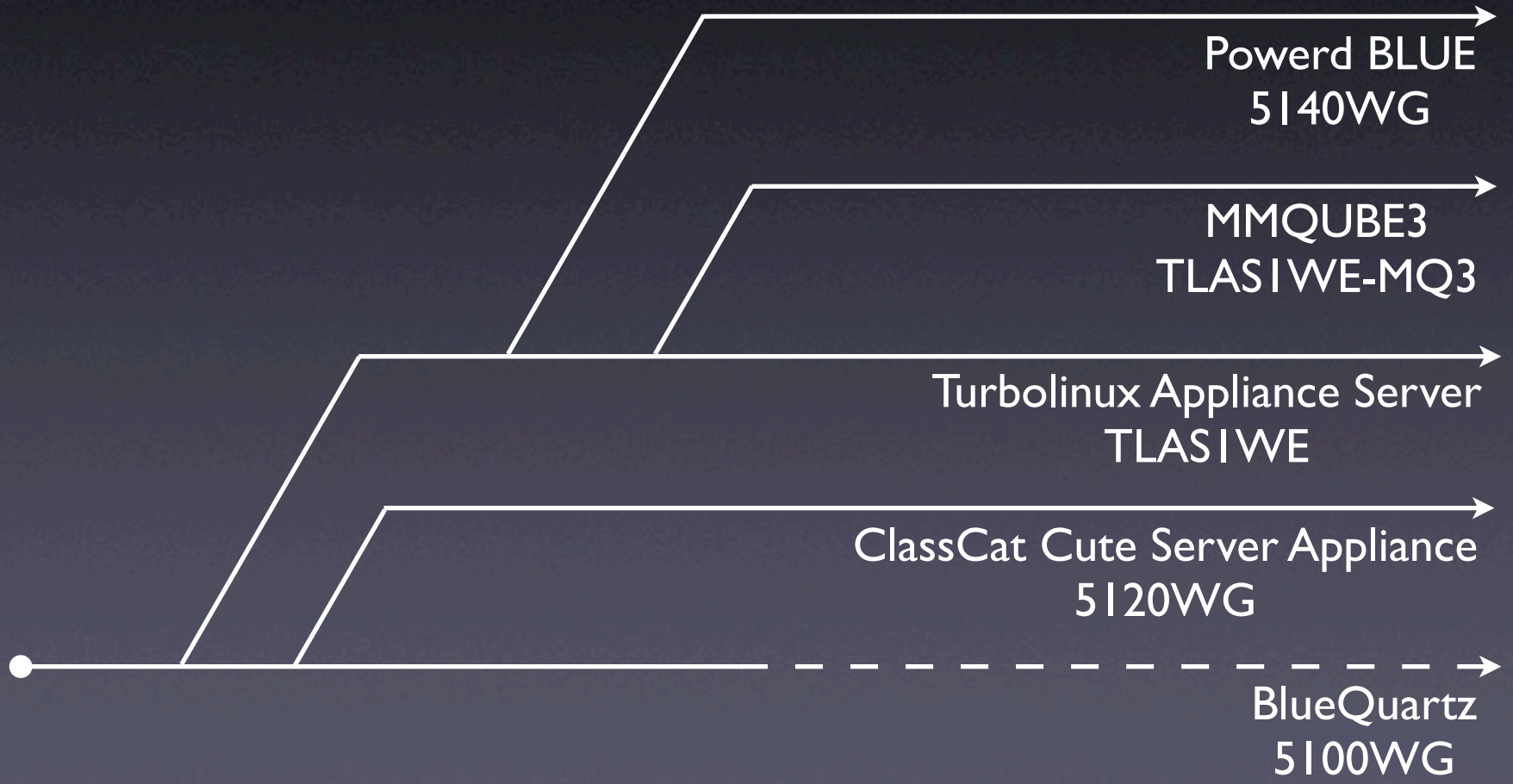


# CobaltからProject BlueQuartzへ



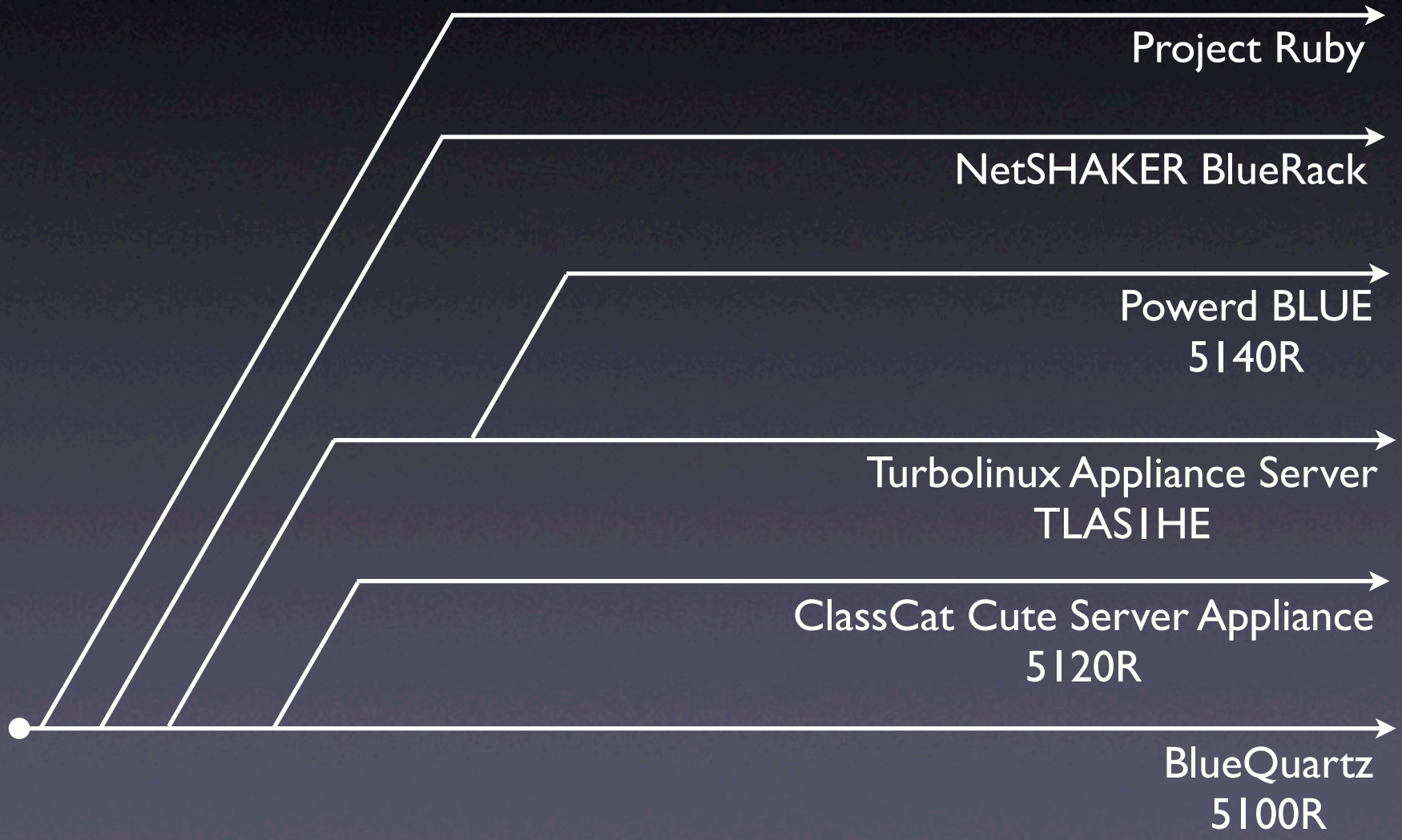
# BlueQuartzとその仲間たち

## - Qube3 -

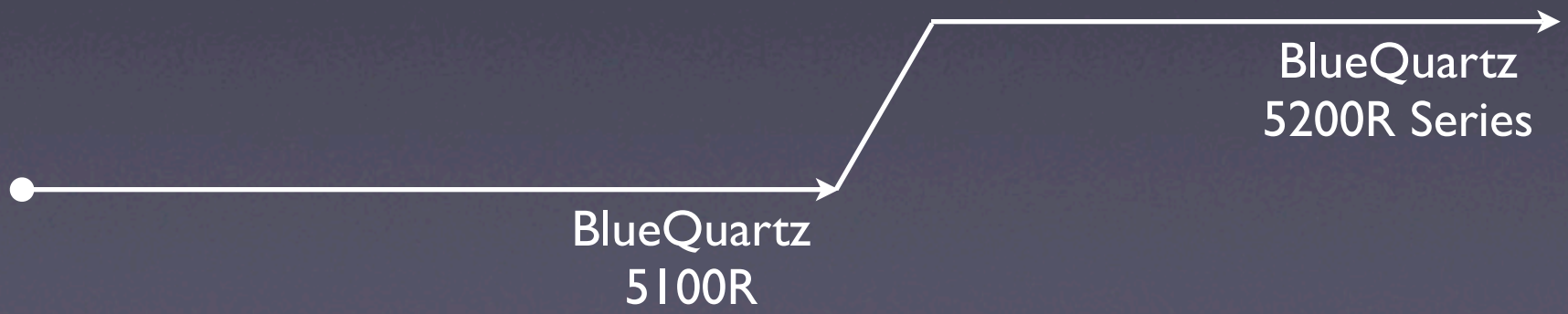


# BlueQuartzとその仲間たち

## - RaQ550 -



# Next Generation BlueQuartz



# 技術的な方向に

# 開発環境

- For i386
  - Xen上で開発
    - 各ディストリビューション毎にbuild用を用意(8G)
- For x86_64
  - x86_64環境でrebootしてrebuild
- For ppc
  - Mac mini

# How to debug

# cced log

- /var/log/messagesにある程度は出力

```
Aug 29 22:36:57 import cced(smd)[4635]: client 5:
[0:4634]: CREATE  User fullName = "Import User 0"
password = xxx volume = "/home" site = site1
sortName = "" name = import_0

Aug 29 22:36:58 import cced(smd)[4635]: client 5:
[0:4634]: CREATE succeeded
```

もっと詳しい口グがみたい・・・

# Run with debug mode

- ccedをdebugモードで起動
  - 通常はデーモンモード
  - swatchは止めておく
    - /etc/cron.d/swatch.cronを編集

```
# /etc/init.d/cced.init stop
# /usr/sausalito/sbin/cced -V -d <mask>
```

# Debug mask

- cce/include/cce_common.h

```
/* debugging values for cce_debug_mask, used throughout cce */
#define DBG_NONE                0x0000
#define DBG_CCED                0x0001
#define DBG_CODB                0x0002
#define DBG_ED                  0x0004
#define DBG_CONF                0x0008
#define DBG_SCHEMA              0x0010
#define DBG_SESSION             0x0020
#define DBG_CSCP                0x0040
#define DBG_SCALAR              0x0080
#define DBG_COMMON              0x0100
#define DBG_CSCP_XTRA           0x0200
#define DBG_TXN                 0x0400
#define DBG_EXCESSIVE           0x8000
```

# Debug mask

- 表示したいdebug maskを加算して指定
  - DBG_CCED 0x0001
    DBG_CODB 0x0002
    DBG_CSCP 0x0040

    -> 0x0043

    ```
    # /usr/sausalito/sbin/cced -V -d 0x0043
    ```
- すべてのdebug情報を表示したい場合

  ```
  # /usr/sausalito/sbin/cced -V -d 0xffff
  ```

# Save debug messages

- debug messageをファイルに保存する

```
# /usr/sausalito/sbin/cced -V -d 0x0043 ¥
  > log.cced 2>&1 &

# tail -f log.cced
```

# cce-shell-tools

# Make cce-shell-tools package

- パッケージをリリースしていないので

```
# cvs co cce-shell-tools

# cd bluequartz/cce-shell-tools

# make 5100r

# yum -y install perl-XML-Parser

# rpm -ivh /usr/src/rpm/RPMS/noarch/
5100R-shell-tools-2.08-0BQ1.noarch.rpm
```

# What is cce-shell-tools

- shellから登録内容を参照・変更
  - caddduser
    caddvsite
    cdeluser
    cdelvsite
    clistuser
    clisevsite
    cmoduser
    cmodvsite

# Use caddvsite

- 仮想サイトの追加

```
# caddvsite --enable-cgi --enable-php ¥
  --hostname import ¥
  --domainname BlueQuartz.org ¥
  --ipaddress 192.168.0.210
```

# Use clistvsite

- 登録されている仮想サイトの一覧

```
# clistvsite

import.BlueQuartz.org   site1   192.168.0.210
import2.BlueQuartz.org  site2   192.168.0.211
```

# Use cadduser

- サイト管理者の追加

```
# cadduser --enable-admin ¥
  --adminpw admin ¥
  --domain import2.BlueQuartz.org ¥
  --fullname='Hisao SHIBUYA' ¥
  --name=hisao --password=hisao ¥
  --quota=100
```

# Use cadduser

- ユーザの追加

```
# cadduser ¥
  --domain import.BlueQuartz.org ¥
  --fullname='Hisao SHIBUYA' ¥
  --name=shibuya2 --password=hisao ¥
  --quota=100
```

# Use clistuser

- 登録されているユーザの一覧

```
# clistuser

admin                                   Administrator
hisao           site2                   Hisao SHIBUYA
shibuya         site1                   Hisao SHIBUYA
shibuya2        site1                   Hisao SHIBUYA
```

# Use cmodvsite

- 仮想サイトの設定変更

```
# cmodvsite ¥
  --fqdn=import2.BlueQuartz.org ¥
  --enable-shellsetting
```

  - FQDNの変更はできない

# cmoduser

- ユーザ情報の変更

```
# cmoduser --name=shibuya2 ¥
  --enable-admin
```

  - --adminpwを設定していないとadminのパスワードを入力する必要がある

# Show log

# Find a User

```
# /usr/sausalito/bin/cceclient

100 CSCP/0.80
200 READY

Find User

104 OBJECT 56
104 OBJECT 58
104 OBJECT 54
104 OBJECT 5
201 OK

BYE
202 GOODBYE
```

# Connect cced

```
17:24:46.916355 [27404] (codb2_glue.c:77): CODB created h(0x80ee288)
client [0:27403] has admin rights
17:24:46.916594 [27404] (cscp_fsm.c:235): cscp_fsm: starting context =
CTXT_CLIENT
17:24:46.916626 [27404] (cscp_write.c:36): << 100 CSCP/0.80
17:24:46.916650 [27404] (cscp_write.c:36): << 200 READY
17:24:46.916659 [27404] (cscp_fsm.c:496): CTXT_CLIENT:STATE_CMD
```

# Find a User

```
17:26:40.574107 [27404] (cscp_fsm.c:1120): >> Find  User
17:26:40.574162 [27404] (codb_find.c:437): Finding a User:
17:26:40.574365 [27404] (cscp_write.c:36): << 104 OBJECT 56
17:26:40.574461 [27404] (cscp_write.c:36): << 104 OBJECT 58
17:26:40.574555 [27404] (cscp_write.c:36): << 104 OBJECT 54
17:26:40.574648 [27404] (cscp_write.c:36): << 104 OBJECT 5
17:26:40.574713 [27404] (cscp_write.c:36): << 201 OK
```

# Disconnect cced

```
17:28:48.470384 [27408] (cscp_fsm.c:1120): >> BYE
17:28:48.470494 [27408] (cscp_write.c:36): << 202 GOODBYE
17:28:48.470515 [27408] (cscp_fsm.c:284): cscp_fsm: returning 0
17:28:48.470535 [27408] (codb2_glue.c:145): CODB destroyed h(0x80ee288)
17:28:48.472056 [27361] (src/smd.c:222): smd_sighandle: caught SIGCHLD
```

# Add a User

```
# /usr/sausalito/bin/cceclient

100 CSCP/0.80
200 READY

Find User

104 OBJECT 56
104 OBJECT 58
104 OBJECT 54
104 OBJECT 5
201 OK
```

# Detail of cadduser process

# Detail
# - Find objects -

- Finding a Vsite
  - import.BlueQuartz.orgの検索
- Finding a System
  - UserDefaultsの取得
- Finding a Vsite
- Finding a User

# Detail
# - Finding a Vsite -

```
17:31:20.360136 [27436] (codb_find.c:437): Finding a Vsite
17:31:20.360225 [27436] (codb_find.c:88): codb_match_against_object: 38
(Vsite)
17:31:20.360264 [27436] (codb_find.c:128): -- key=.fqdn
val=import2.BlueQuartz.org
17:31:20.360275 [27436] (codb_find.c:161):     comparing: 38..fqdn
"import2.BlueQuartz.org" =? "import.BlueQuartz.org": 17:31:20.360282
[27436] (codb_find.c:179): no match
17:31:20.360289 [27436] (codb_find.c:88): codb_match_against_object: 23
(Vsite)
17:31:20.360308 [27436] (codb_find.c:128): -- key=.fqdn
val=import.BlueQuartz.org
17:31:20.360316 [27436] (codb_find.c:161):     comparing: 23..fqdn
"import.BlueQuartz.org" =? "import.BlueQuartz.org": 17:31:20.360322
[27436] (codb_find.c:177): MATCH
17:31:20.360344 [27436] (cscp_write.c:36): << 104 OBJECT 23
```

# Detail
# - Finding a User -

```
17:31:20.517939 [27436] (cscp_fsm.c:1120): >> FIND  User site = site1
17:31:20.517954 [27436] (codb_find.c:437): Finding a User:
17:31:20.517991 [27436] (codb_find.c:88): codb_match_against_object: 60
(User)
17:31:20.518006 [27436] (codb_find.c:128): -- key=.site val=site1
17:31:20.518013 [27436] (codb_find.c:161):     comparing: 60..site
"site1" =? "site1":
17:31:20.518021 [27436] (codb_find.c:177): MATCH
17:31:20.518028 [27436] (codb_find.c:88): codb_match_against_object: 56
(User)
17:31:20.518055 [27436] (codb_find.c:128): -- key=.site val=site2
17:31:20.518062 [27436] (codb_find.c:161):     comparing: 56..site
"site2" =? "site1":
17:31:20.518069 [27436] (codb_find.c:179): no match
17:31:20.518076 [27436] (codb_find.c:88): codb_match_against_object: 58
(User)
```

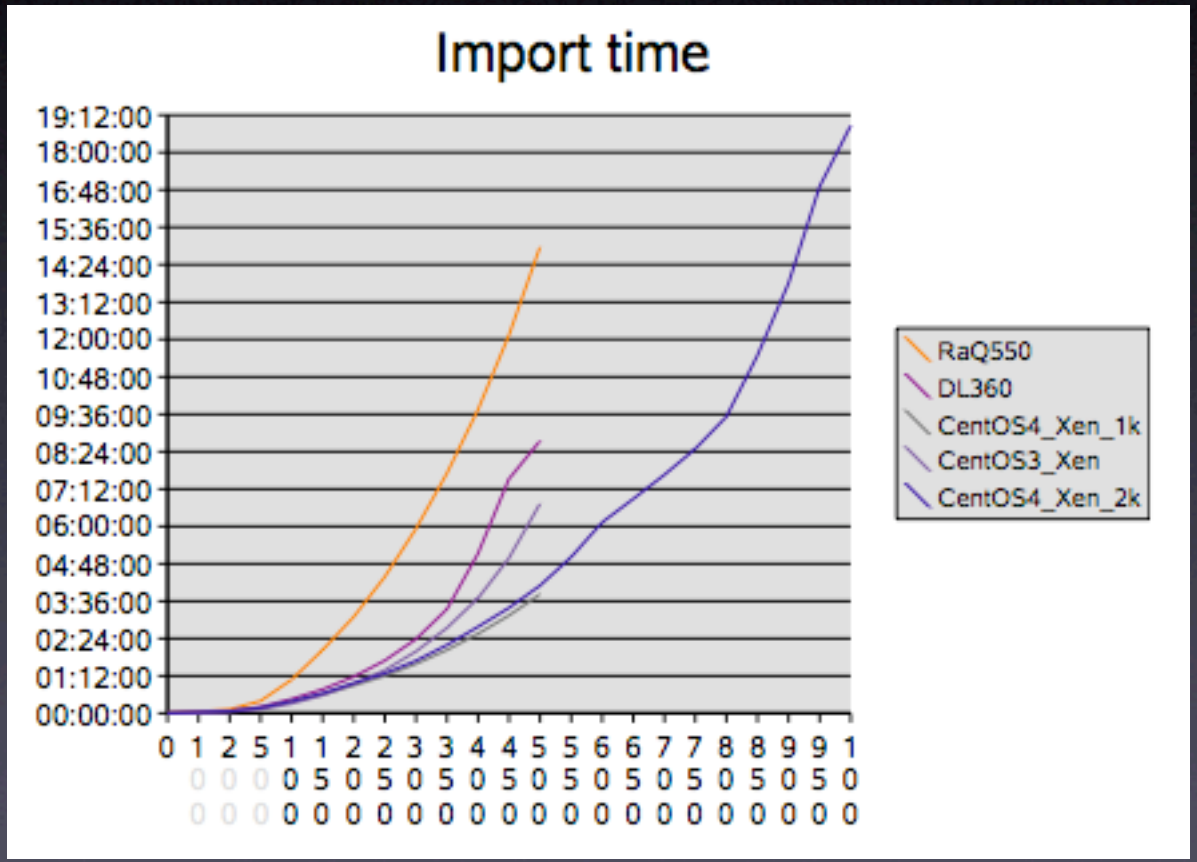
# How many times to find objects?

- cadduser command
  - Finding a Vsite
    - 5
  - Finding a System
    - 7
  - Finding a User
    - 2

# How many times to find objects?

- Import
  - Finding a Vsite
    - 4
  - Finding a System
    - 6
  - Finding a User
    - 9

# Result of user import



# Performance tuning

- 方法
  - ccedにキャッシュを搭載
  - codbをRDBに変更
    - SQLite
    - MySQL
    - PostgreSQL

# Performance tuning

- ccedにキャッシュを搭載
  - ccedを入れ替えるだけですむ
    →互換性を保つことができる

# Performance tuning

- codbをRDBに変更
  - 互換性がなくなる
  - SQLite
    - 速くなるか微妙
  - MySQL
    - 製品の際にライセンスが発生
  - PostgreSQL
    - 速くなるか微妙

# Imprement shared cache in cced

- キャッシュサイズは?
  - 1ユーザ登録したときのcodbのサイズ

```
-rw-------  1 root root  4 Aug 30 02:49 10000/.CLASS
-rw-------  1 root root  3 Aug 30 02:49 10000/.CLASSVER
-rw-------  1 root root  5 Aug 30 02:49 10000/.OID
-rw-------  1 root root 13 Aug 30 02:49 10000/.crypt_password
-rw-------  1 root root 16 Aug 30 02:49 10000/.fullName
-rw-------  1 root root 34 Aug 30 02:49 10000/.md5_password
-rw-------  1 root root 11 Aug 30 02:49 10000/.name
-rw-------  1 root root  5 Aug 30 02:49 10000/.site
-rw-------  1 root root 11 Aug 30 02:49 10000/APOP.apop_password
-rw-------  1 root root  2 Aug 30 02:49 10000/Disk.quota

SubTotal              104 Byte
```

# Imprement shared cache in cced

- キャッシュサイズは?
  - 1ユーザ登録したときのcodbのサイズ

```
-rw-------  1 root root 10 Aug 30 02:49 10001/.CLASS
-rw-------  1 root root  3 Aug 30 02:49 10001/.CLASSVER
-rw-------  1 root root  5 Aug 30 02:49 10001/.OID
-rw-------  1 root root 11 Aug 30 02:49 10001/.action
-rw-------  1 root root 11 Aug 30 02:49 10001/.alias
-rw-------  1 root root 20 Aug 30 02:49 10001/.fqdn
-rw-------  1 root root  5 Aug 30 02:49 10001/.site

SubTotal                 65 Byte

Total                   169 Byte
```

# Imprement shared cache in cced

- キャッシュサイズは?
  - 10000ユーザの場合
    - 200 Byte x 10000 = 2MB
- 32MBあれば結構いけそう?

# Q and A