

BlueQuartz Development in Deep

Sep, 2, 2005

Project BlueQuartz

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What is Sausalito?

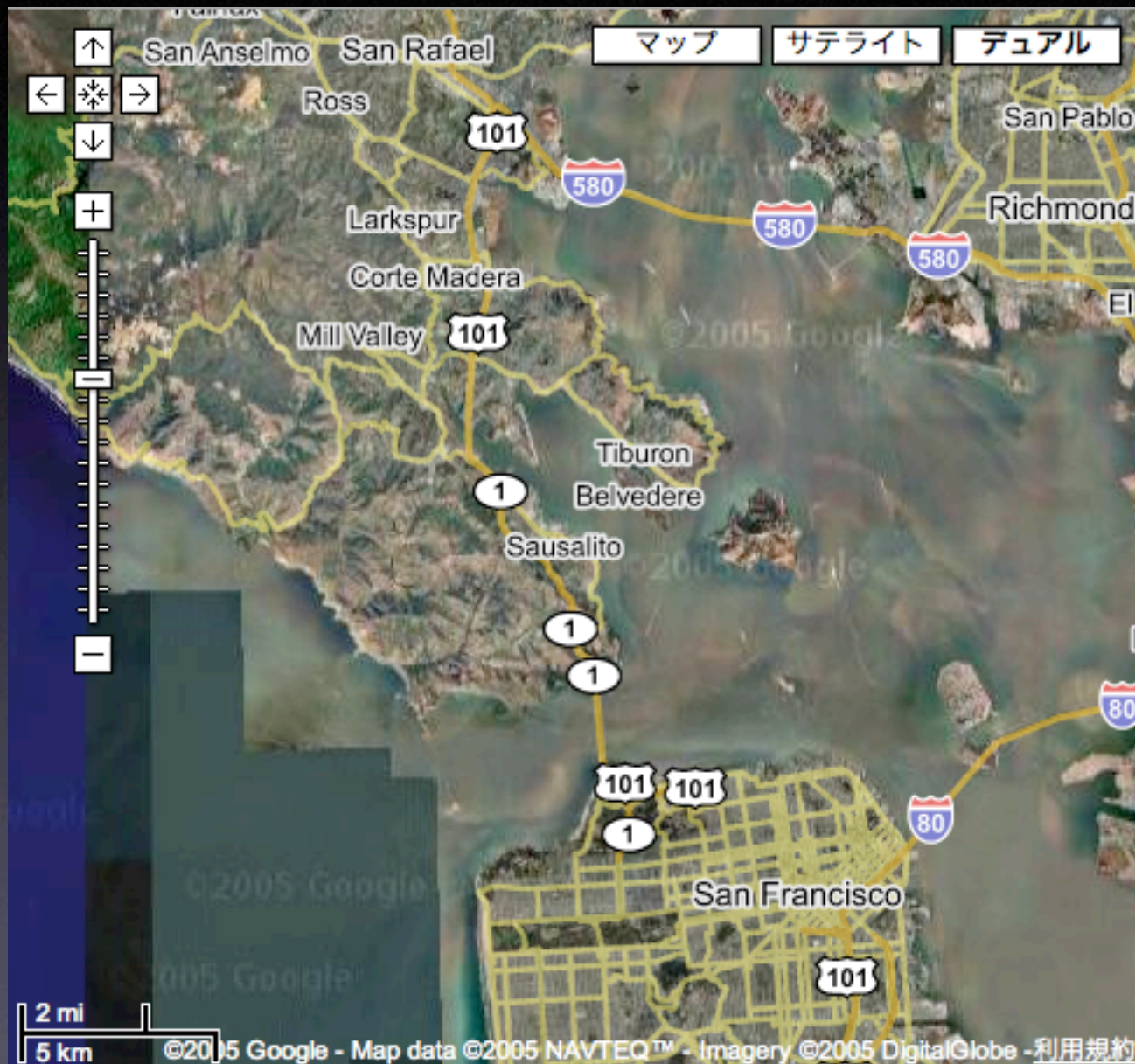
- Cobalt Qube3/RaQ550のGUI
- RaQXTRの一部にも使われているが . . .

RaQXTRは(RaQ4+Qube3)/2という感じ

- BlueQuartzのcore

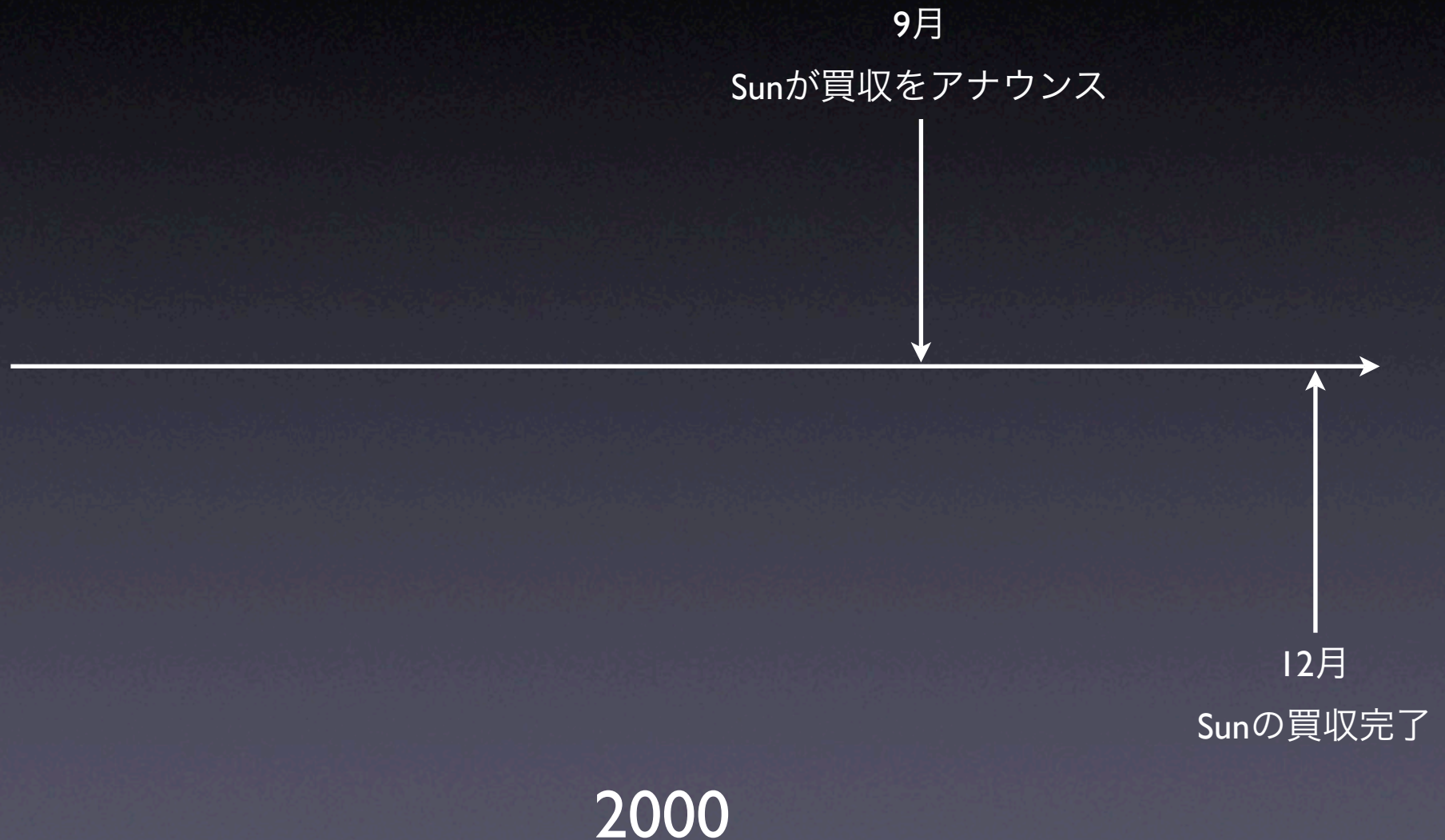
おなじみの . . .

Where is Sausalito?



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

CobaltからProject BlueQuartzへ

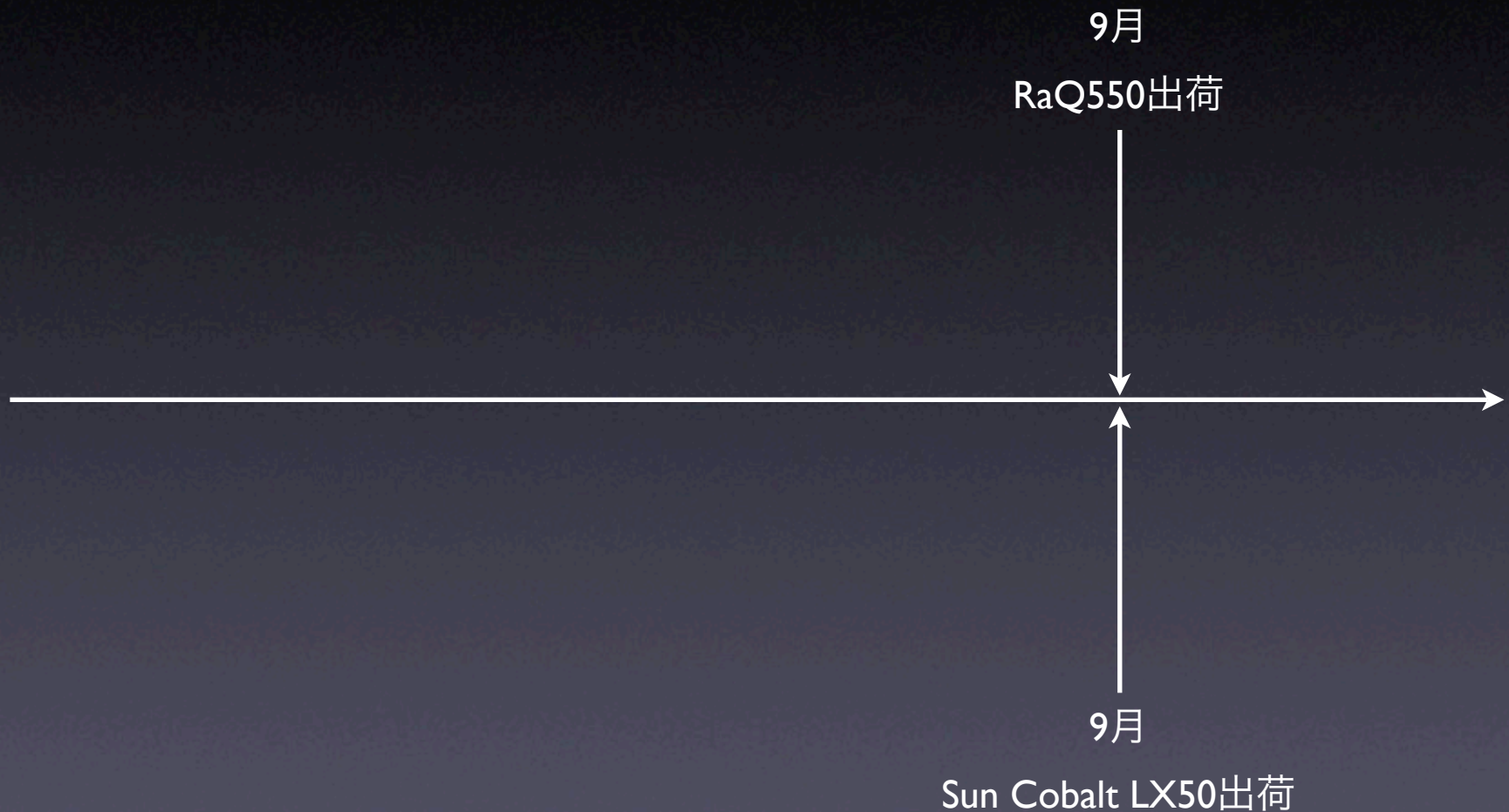


CobaltからProject BlueQuartzへ



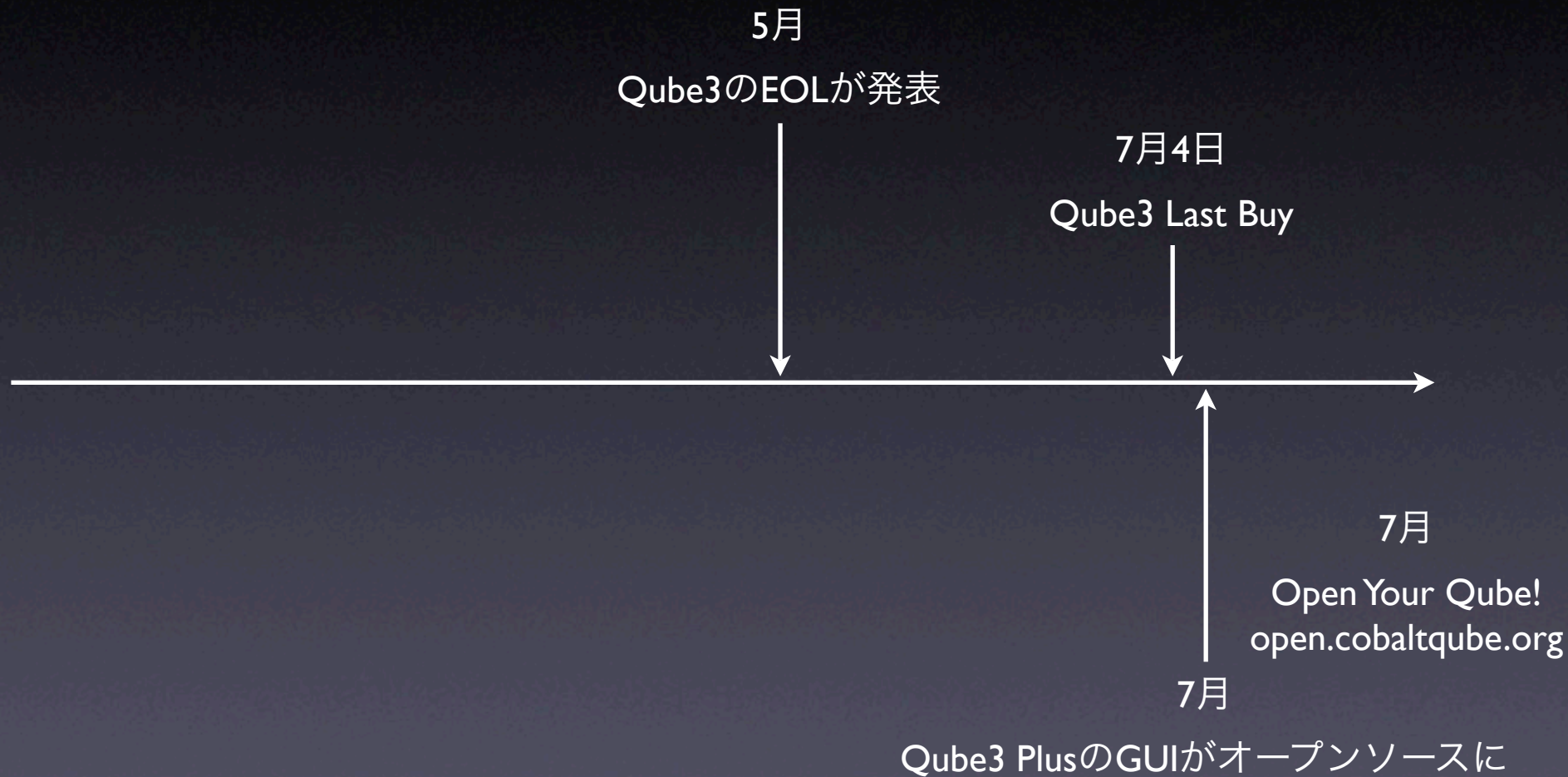
2001

CobaltからProject BlueQuartzへ



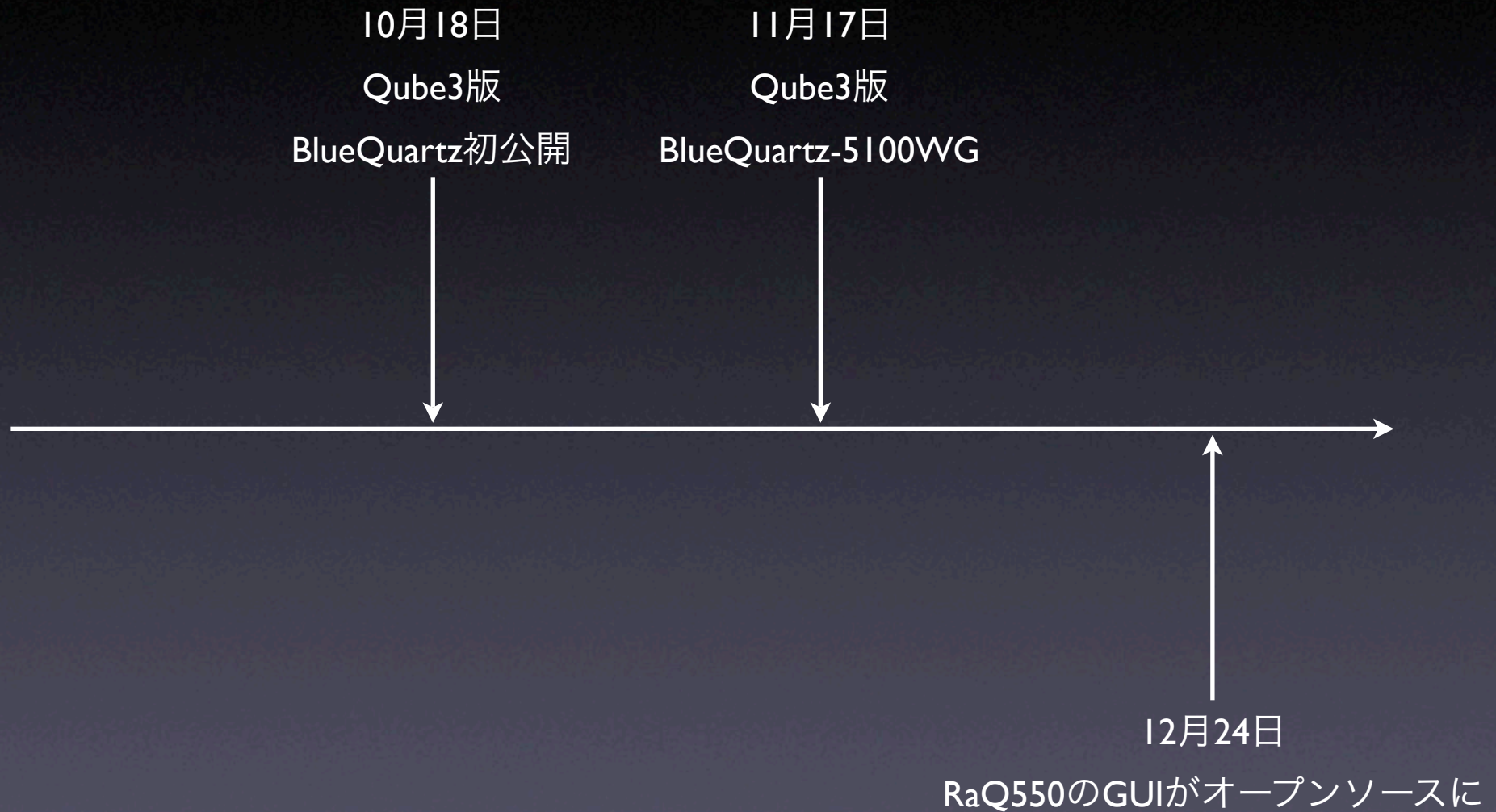
2002

CobaltからProject BlueQuartzへ



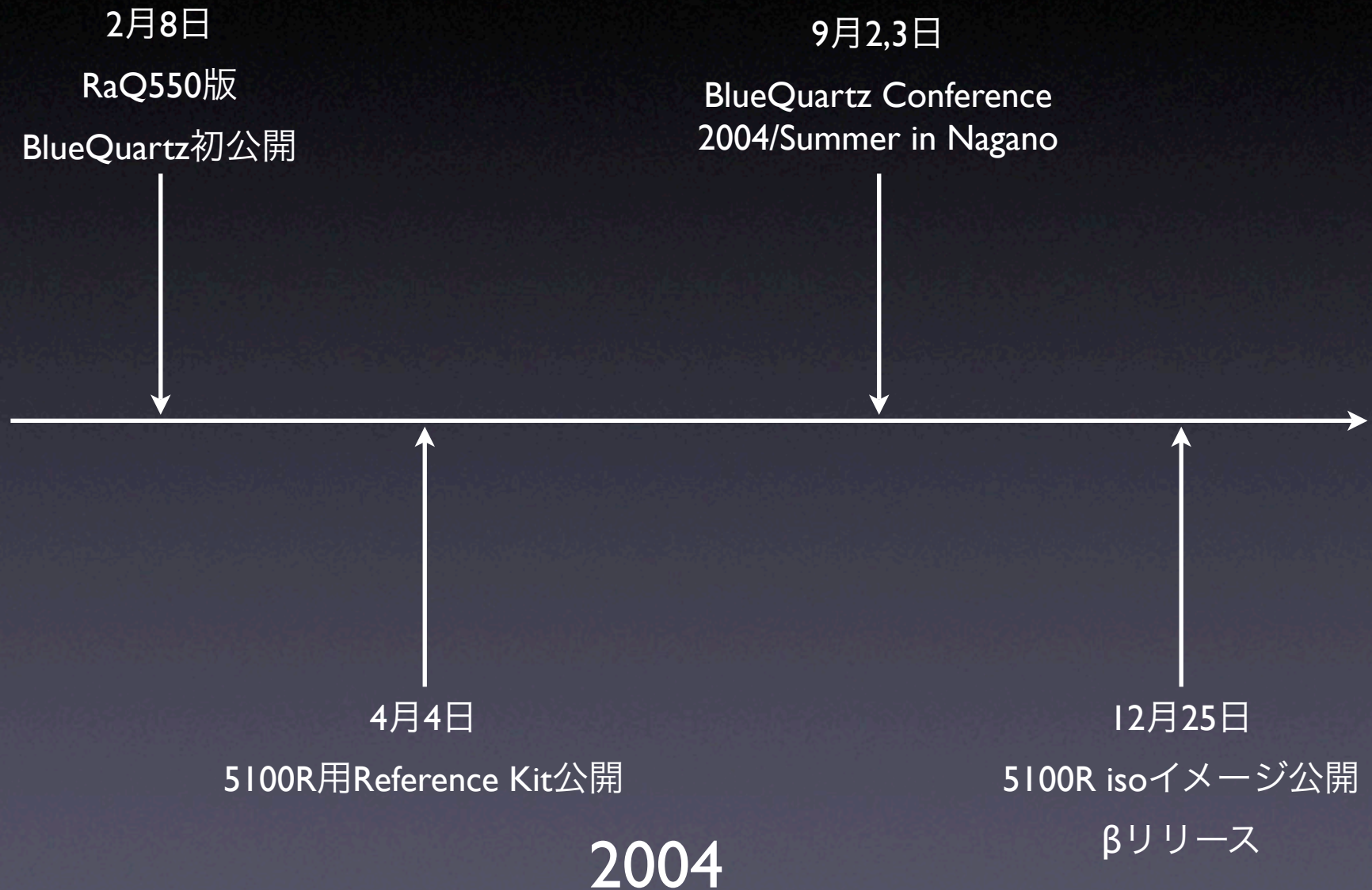
2003

CobaltからProject BlueQuartzへ

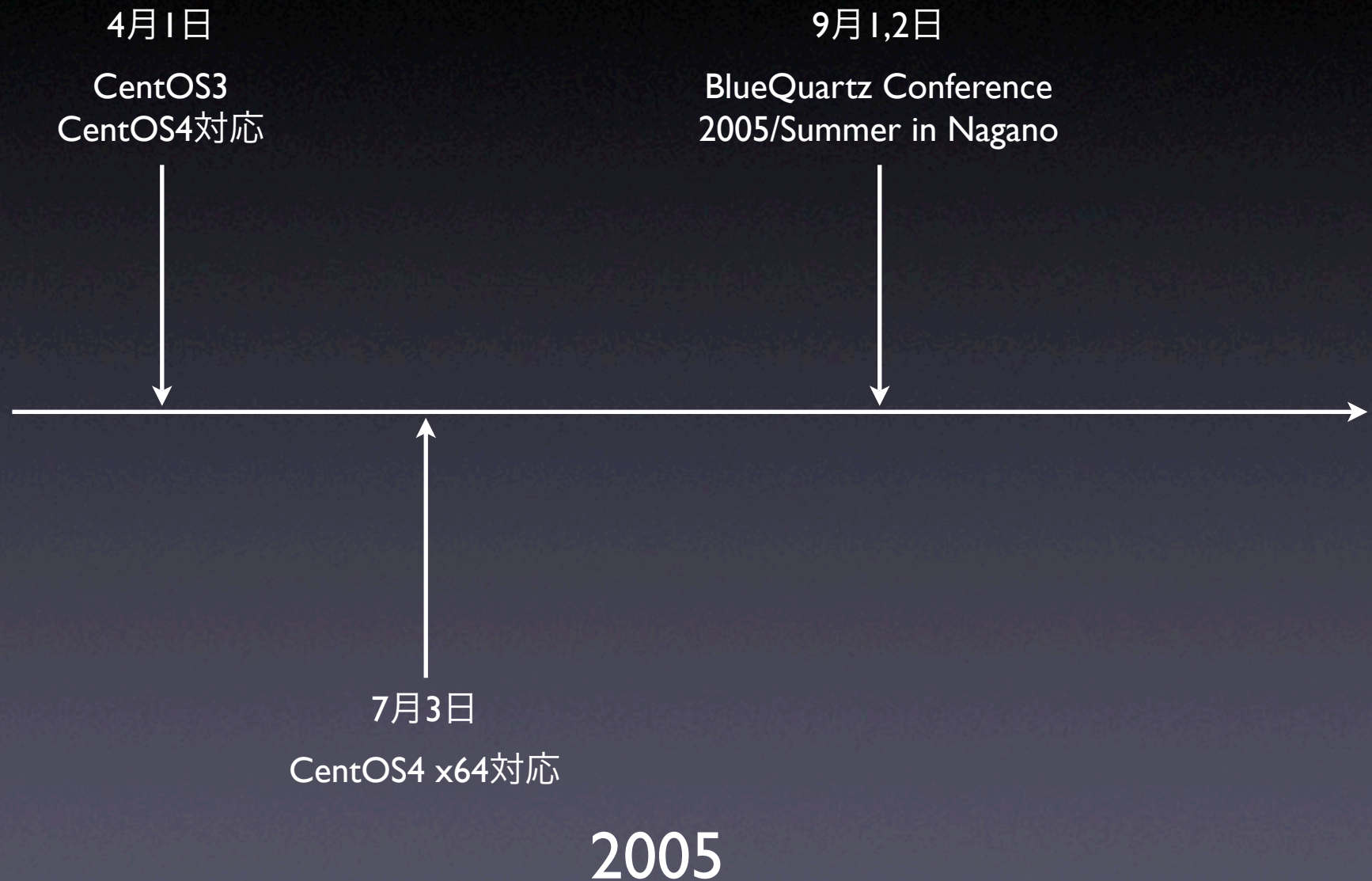


2003

CobaltからProject BlueQuartzへ

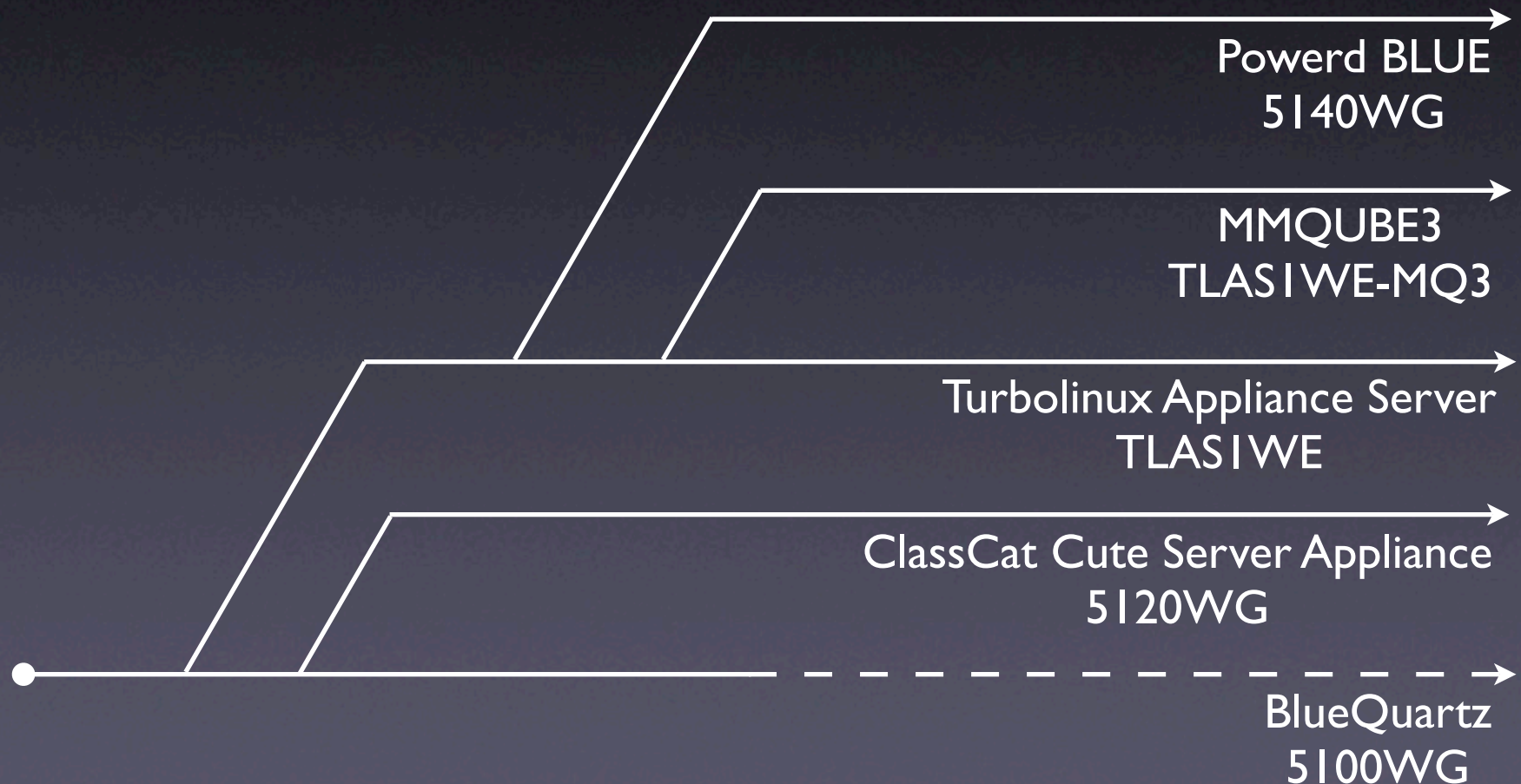


CobaltからProject BlueQuartzへ



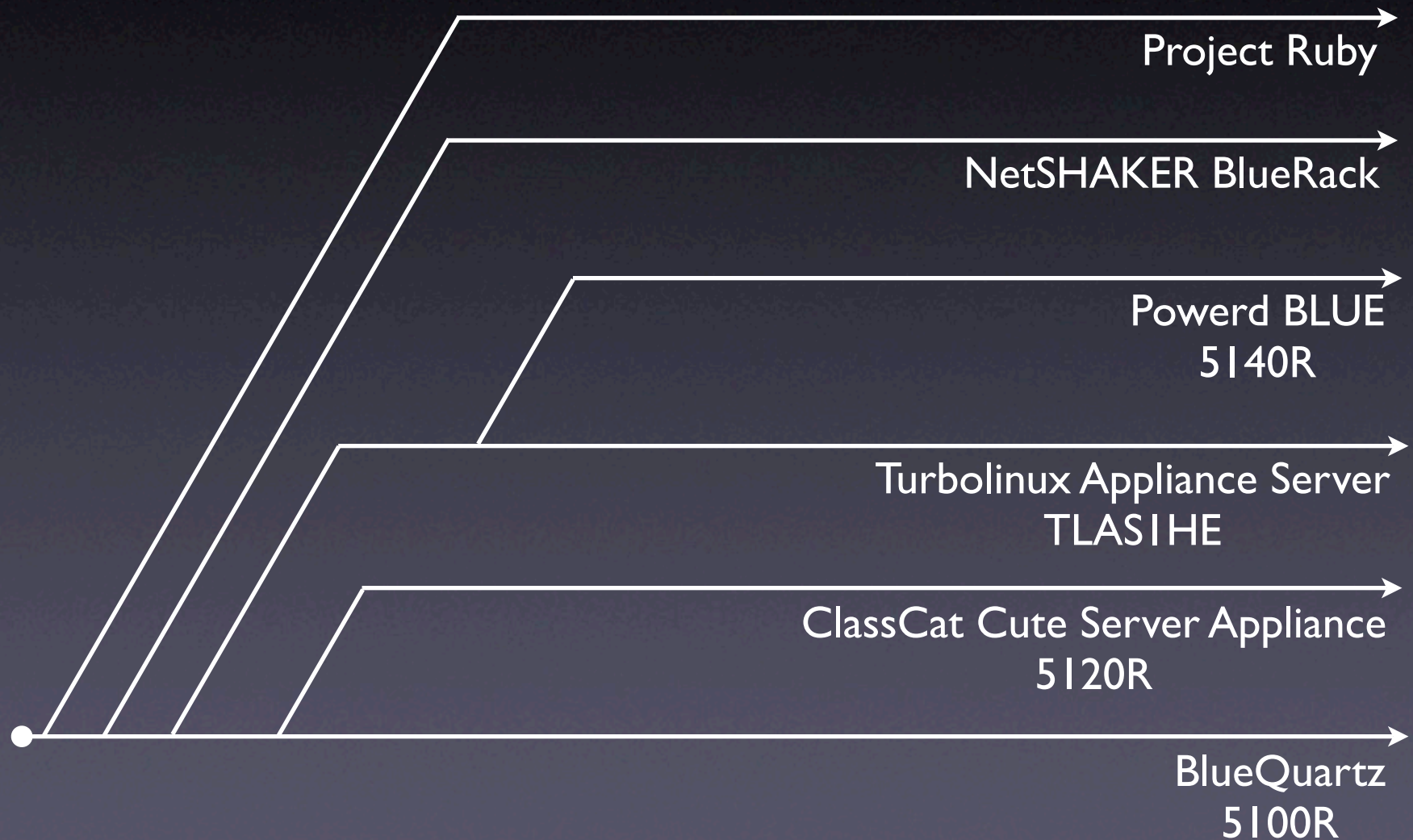
BlueQuartzとその仲間たち

- Qube3 -

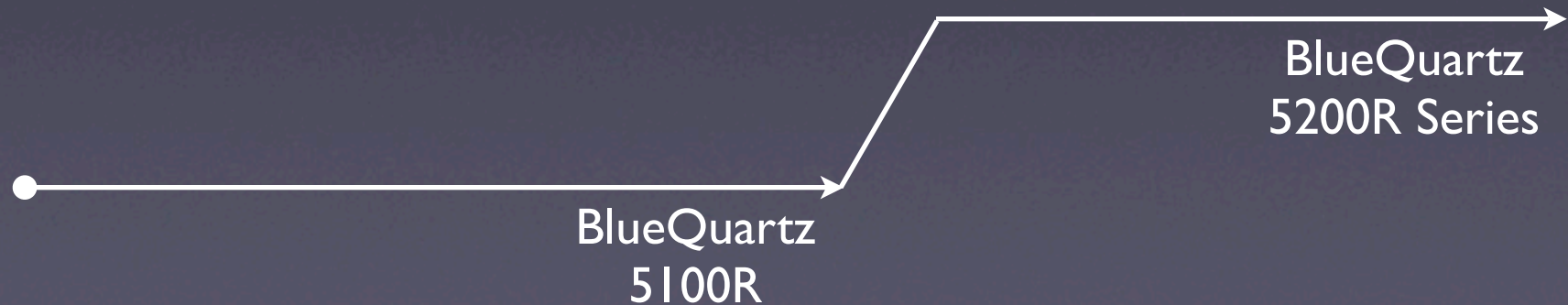


BlueQuartzとその仲間たち

- 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
```

もっと詳しいログがみたい . . .

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
  - cadduser
  - 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?

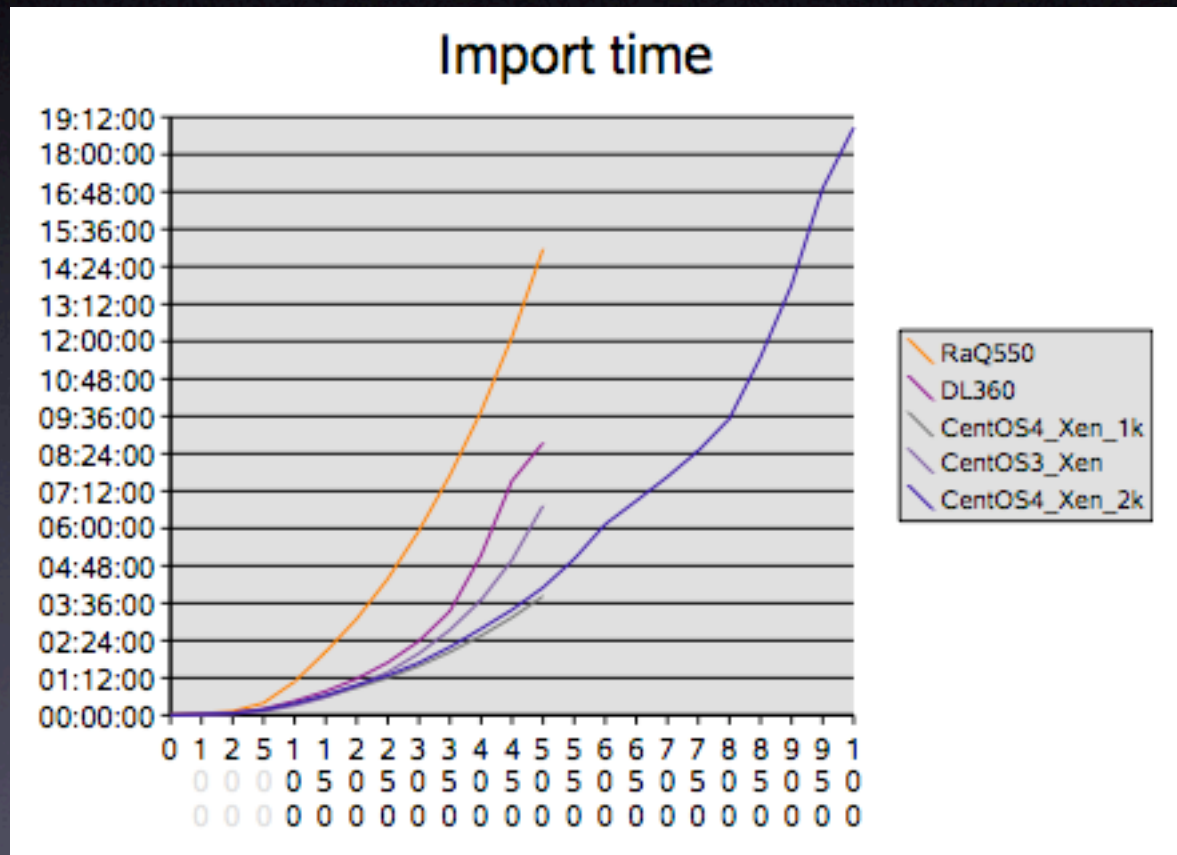
- cadduser command
  - Finding a Vsite
    - 5
  - Finding a System
    - 7
  - Finding a User
    - 2



# 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

# Implement 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



# Implement 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
```

# Implement shared cache in cced

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



Q and A