IOC Development Workflow

```
Create IOC          Build IOC          Boot
(makeBaseApp)  →     (make)      →      IOC
                        ↑               (./st.cmd)
                   Create or
                   Modify
                   Databases
                   (vdct)
```

Terminology

IOC	input output controller – provides PVs
PV	process variable – a named piece of data
Record	an object with:
	– a unique name
	– a behavior defined by its record type (class)
	– controllable properties (fields)
	– optional associated hardware I/O (device support)
	– links to other records
.db file	database file – a collection of records
st.cmd	script that is executed at IOC boot time

Conventions

courier	text to be typed at the command prompt
bold	text to be replaced, not typed verbatim
$	command prompt

Create IOC

0. Prerequisites
Use SecureCRT to connect to lcls-dev2
Use bash: ask SCCS to make bash your default shell, or type `bash` after you connect to lcls-dev2.
Make sure the file ~/.bashrc contains the following line:
> source /afs/slac/g/lcls/epics/setup/epicsReset.bash

1. Create a top directory for your IOC
```
$ cd ~
$ mkdir work
$ cd work
$ mkdir name (choose a name for your top directory.  example: myfirstioc).
```
The directory you just created will be referred to as ioctop

2. Create the ioc project
```
$ cd ioctop (top directory that you created above)
$ makeBaseApp.pl -t example appname (choose an application name.  example: firstioc)
$ makeBaseApp.pl -i -t example appname
```
"What architecture do you want to use?" linux-x86
"What application should the IOC(s) boot?" (press enter)

3. Look at your IOC
```
$ cd ioctop
$ ls
```
You will see:
Makefile configure/ iocBoot/ **appname**App/

4. Make the IOC startup script executableZ
```
$ cd ioctop/iocBoot/iocappname
$ chmod +x st.cmd
```

Build IOC

```
$ cd ioctop
$ make clean uninstall
$ make
```

Boot IOC

```
$ cd ioctop/iocBoot/iocappname
$ ./st.cmd
```
Now you're inside the ioc shell. Here are a few useful commands inside this shell, with the most common commands in italics:

dbl	lists all records in this ioc
dbgrep **search_pattern**	lists all records with names matching search pattern
dbnr	number of records - shows a count of all records, sorted by type
dbpr **record_name**	print record - shows info about a particular record
dbpf **record_name value**	put field - write a value to a particular record
casr	channel access server report - show who is connecting to this IOC
dbcar	channel access report - show status of channel access links
dbior	input output report
dbhcr	hardware configuration report
help	list of ioc commands
exit	shut down the ioc

Create or Modify Databases

1. Open vdct and select a database definition (dbd) file
```
$ vdct
```
At the first prompt, select the dbd file **ioctop**/dbd/**appname**.dbd

2. Load your database in vdct
Open your database using File –> Open. Be sure to load the file from **ioctop**/**appname**App/Db

3. Make your changes
Online intro to vdct: http://www.aps.anl.gov/aod/bcda/epicsgettingstarted/iocs/dbdesignvdct.html

4. Save changes
File –> Save. Be sure to save the files in **ioctop**/**appname**App/Db

5. Verify that your db file will be copied to ioctop/db when you build
Open **ioctop**/**appname**App/Db/Makefile in a text editor and verify that your db file is listed

6. Verify that your database files will be loaded when the IOC boots
Open **ioctop**/iocBoot/ioc**appname**/st.cmd in a text editor and check to see that all your databases are listed in the "dbLoadRecords" section.