EPICS Execution Flow

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IOC Initialization

- ld (vxWorks command)
    - iocCore
    - drvSup
    - recSup
    - devSup
- dbLoad("default.dctsdr")
    - Loads definitions of menus, record types, device types, driver types, etc.
- dbLoad("xxx.database"), dbLoadRecords, dbLoadTemplates
    - Loads record instances

IOC Initialization (cont.)

- iocInit (main steps)
    - Dynamically link to record, device, and driver support (support entry tables)
    - Start general purpose tasks (log server, task watchdogs, callback, etc)
    - Initialize drivers
    - Initialize records (two passes) and devices
    - Start scan tasks
    - Start access security
    - Start Channel Access Server

Record Processing: Common Part

- Decide to process a record (Database Scanning)
  - Periodic
  - I/O Interrupt
  - Event
  - Passive
- Skip if record is already active
- Skip if record is disabled
- Call record support process routine
- Linked Records (input, output, forward) (Process Passive)
  - Process routines are called recursively.

Process: Synchronous I/O

- Set PACT true (processing active)
- Perform I/O operation
    - For hardware link access via device support
    - For database link, recursive processing may be invoked
    - For channel access link
        - inputs are monitored - just retrieve latest value
        - outputs are handled by separate task
- Check for record specific alarm conditions
- Raise channel access monitors for any fields modified while processing
- Request processing of forward link
- Set PACT false

Process: Asynchronous I/O

- Asynchronous Start (Called by iocCore)
    - Set PACT true (processing active)
    - Start I/O operation (normally device support does this)
    - return leaving PACT true
- Asynchronous Completion (record/device support directly calls process)
    - Complete I/O operation
    - Check for record specific alarm conditions
    - Raise channel access monitors for any fields modified while processing
    - Request processing of forward link
    - Set PACT false
    - return

Channel Access

- Search
    - Perform broadcast (normally local subnet) of PV name
    - Each ioc has CA broadcast listener.
    - IOC that contains PV sends UDP message back to client
    - For each IOC containing PVs for client a TCP connection is established
    - For each client IOC establishes following tasks
        - Server task (handles all communication except monitors)
        - Event task (handles monitors raised by record support or iocCore)
- Get
    - Issue request and wait for reply

Channel Access (cont.)

- Put
  - Issue put and complete without waiting for response
  - May cause record processing
- Add event
  - Ask for monitors to be set on PV (record.field)
- put notify
  - Issue put and wait for completion
  - Completion is all records completing asynchronous phase of processing
- Connection management, Access security, Error handling, etc.

ezca (Easy Channel Access)

- Automatic search on first reference
- Simplified request types
- Only PV names - No Channel Ids
- Simplified error handling