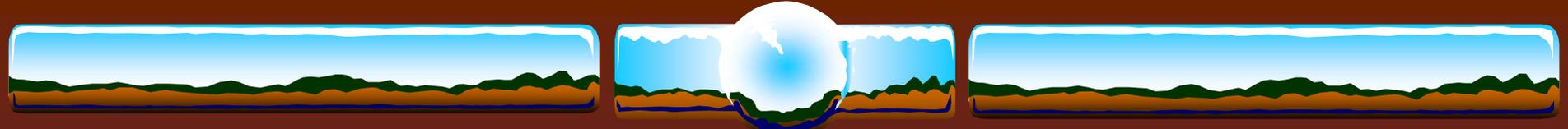# EPICS Channel Access Server Configuration

Jeff Hill

CA Server Configuration

❖ When server specific configuration details need to be specified

❖ When server and client libraries are both operating in the same address space (same process)

    ❖ Client and server configuration may need to be independent

❖ Warning: there are currently two server implementations, and some of the configuration detailed herein isn't yet available with IOCs
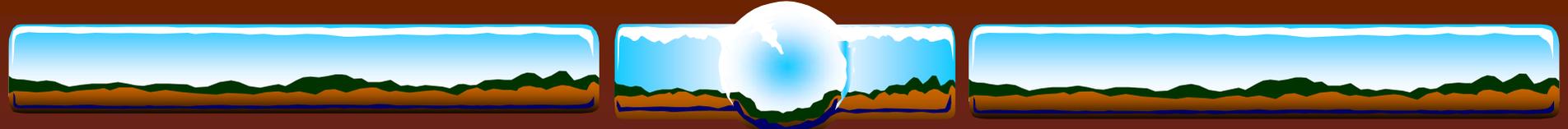
CA Server Port Configuration

- ❖ Use this environment variable to set the server's port independent of the client's port
  - ❖ EPICS_CAS_SERVER_PORT
    - ❖ Default: use client configuration
   - ❖ EPICS_CA_SERVER_PORT
  - ❖ Expected: $i > 5000$
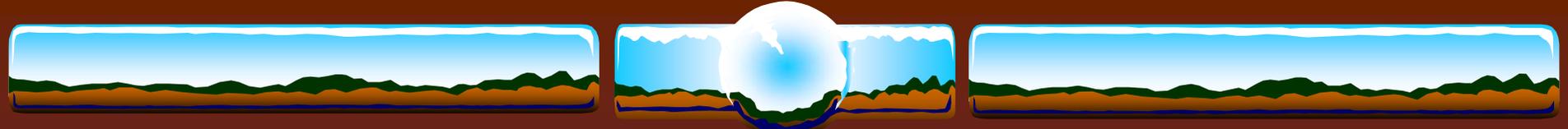
Multiple Servers on The Same Host

❖ Two UDP servers may share the same port on same host, but there are restrictions

   ❖ Visible with broadcast, multicast, but not reliably with unicast

❖ Two TCP servers may not share same port on the same host
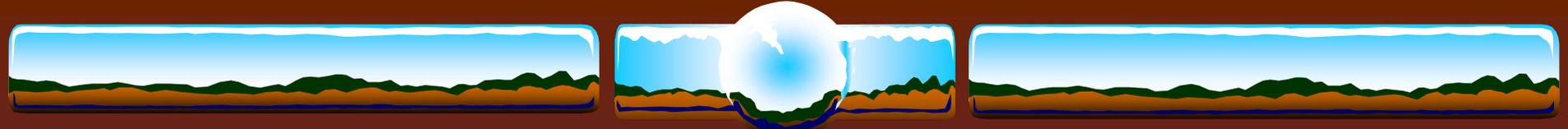
# Multiple CA Servers on Same Host Using the Same Port Assignment

❖ First server uses assigned TCP port – as expected

❖ Second server receives ephemeral port assignment

   ❖ Both servers share the same UDP port assignment

   ❖ UDP response includes ephemeral port assignment

      ❖ Therefore clients can connect transparently

      ❖ But… unicast limitations can be source of confusion

   ❖ Proper addition of multicast support would solve this problem
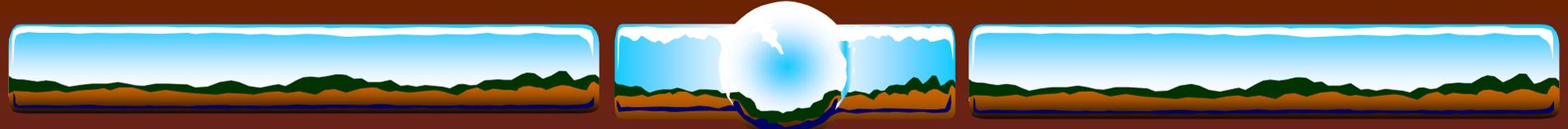
Server Beacons

❖ Purpose

   ❖ Efficiently communicate server state of health

      ❖ Clients do not know if the server is responsive if there has not been recent TCP traffic

   ❖ Notify clients about new servers

   ❖ Clients search very slowly for server challenged channels
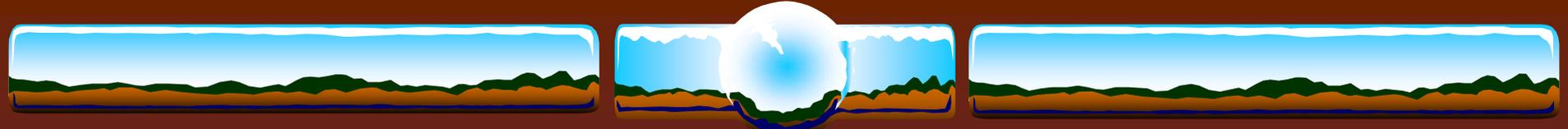
Consequences of Clients not Seeing Server's Beacon

❖ In multi-subnet systems opportunities exist for client to not see beacons from every server

  ❖ Consequences

    ❖ Clients waste bandwidth sending periodic state-of-health messages over TCP to servers that they are connected to
   ❖ Clients may connect slowly to a newly introduced server
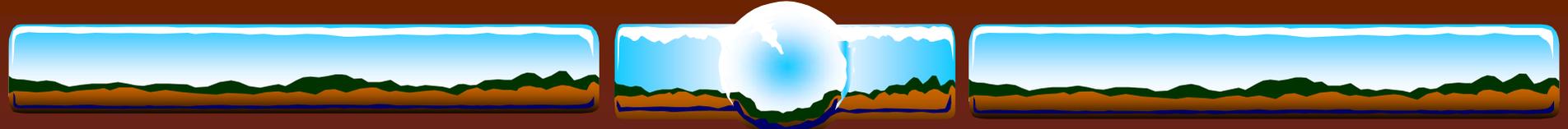
CA Repeater

- ❖ Multiple client processes on the same host
  - ❖ Not possible for all of them to directly receive a copy of the server beacon messages
    - ❖ When beacon messages sent to unicast addresses
    - ❖ When legacy IP kernels are still in use
- ❖ CA Repeater is a simple fan out daemon
  - ❖ It auto starts if a client detects that it isn't running and it is in the path.
- ❖ Start the repeater in a boot script if you will run IOCs on your workstation
  - ❖ Avoids clients becoming dependent on an IOCs repeater thread
    - ❖ The IOC might be stopped or restarted
- ❖ Multicast upgrades might eliminate CA Repeater
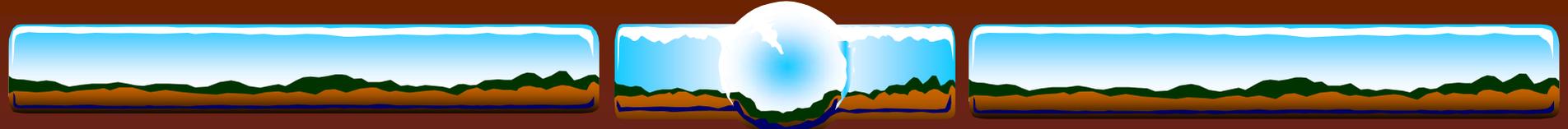
# CA Server Beacon Address List *Auto* Configuration

❖ The beacon destination address list is auto initialized to the broadcast addresses of each attached network interface if the following environment variable is set to "YES"

❖ EPICS_CAS_AUTO_BEACON_ADDR_LIST

   ❖ Default: use client library configuration

      ❖ EPICS_CA_AUTO_ADDR_LIST

   ❖ Expected: YES, NO
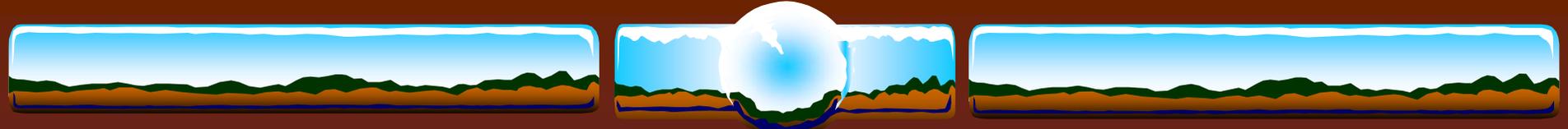
CA Server Beacon Address List
Manual Configuration

❖ Use this environment variable to set the server's beacon destination address list manually

    ❖ EPICS_CAS_BEACON_ADDR_LIST

        ❖ Default: use client library configuration

            ❖ EPICS_CA_ADDR_LIST

                ❖ But, default to empty if EPICS_CAS_INTF_ADDR_LIST is set

        ❖ Expected: N.N.N.N N.N.N.N:P ...
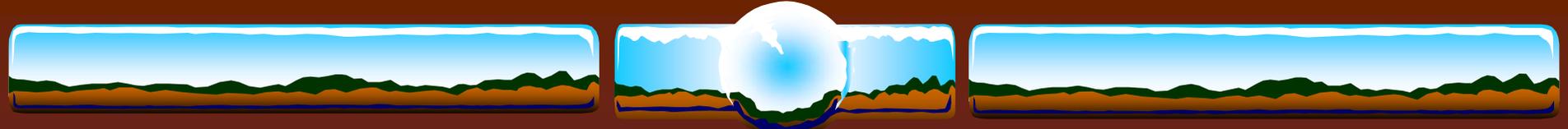
CA Server Beacon Period Configuration

❖ Beacon period should be no greater than one half of client side channel inactivity disconnect timeout

❖ Set this environment variable

  ❖ EPICS_CAS_BEACON_PERIOD

  ❖ Default:15.0 seconds

  ❖ Expected: $p > 0.1$ seconds
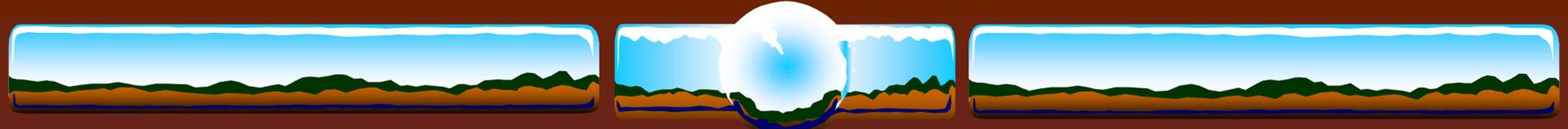
Server Beacon Destination Port

❖ Set this environment variable

  ❖ EPICS_CAS_BEACON_PORT

  ❖ Default: EPICS_CA_REPEATER_PORT

  ❖ Expected: $i > 5000$
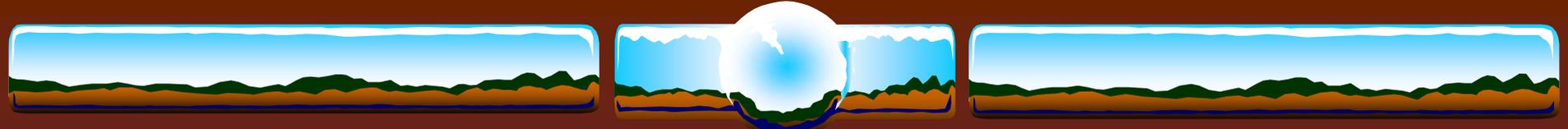
# Server May Selectively Listen on a Subset of Local Network Interfaces

❖ Type "netstat –i" or "ifconfig" on UNIX systems

❖ Type "ipconfig" on windows systems

❖ Set this environment variable to bind limited set

   ❖ EPICS_CAS_INTF_ADDR_LIST

   ❖ Default: bind to all directly attached and enabled network interfaces

   ❖ Expected: N.N.N.N N.N.N.N:P ...
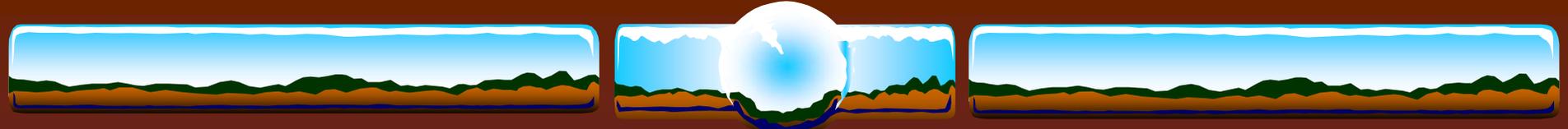
Ignore Requests From Specified Addresses

❖ Set this environment variable to ignore requests from a limited set of addresses

  ❖ EPICS_CAS_IGNORE_ADDR_LIST

  ❖ Default: accept requests from all addresses

  ❖ Expected: N.N.N.N N.N.N.N:P ...
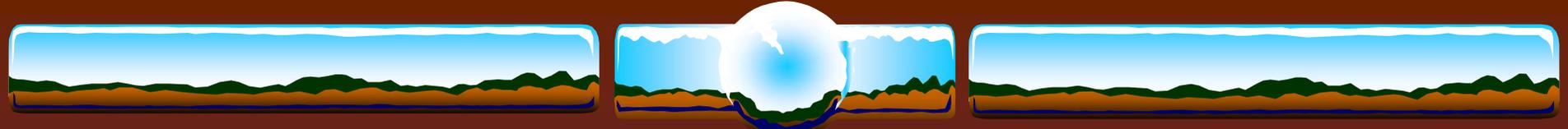
Maximum Buffer Size

❖ This environment variable determines maximum array (over 16 K Bytes) that may be sent

  ❖ EPICS_CA_MAX_ARRAY_BYTES

  ❖ Default: no more than 16K Bytes

  ❖ Expected: size in bytes

  ❖ Must match client configuration

  ❖ Free lists used for memory management