IBM System z

IBM OSA-Express Integrated Console Controller (OSA-ICC) Implementation for System z

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OSA ICC Agenda

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  - Pre-OSA ICC Configuration
- **Requirements**
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- **OSA Express3/4S/5S – 1000BaseT**
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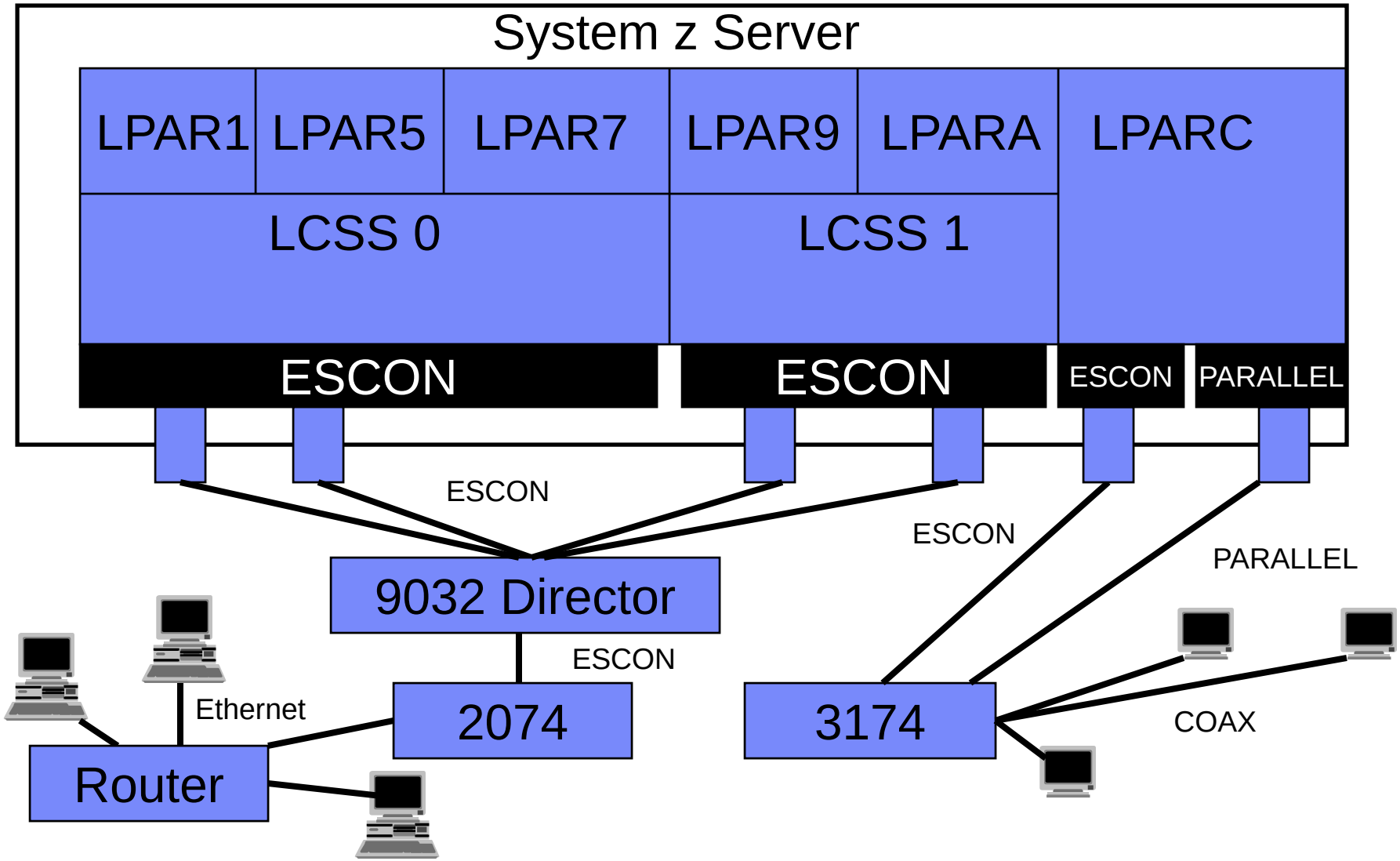
Description

- Console Controller for IBM System z Servers zEC12, zBC12, z196, z114, z10 EC, z10 BC, z9 EC, z9 BC, z990 and z890
  - System Console (IPL) and operations support for multiple LPARs
  - 120 Sessions per CHPID
- Exclusive to OSA 1000BASE-T features
  - 10/100/1000 Mbps (1 Gbps)
    - No Token-Ring
    - RJ-45 connection to category 5 Unshielded Twisted Pair (UTP) copper cabling
  - Port operation defined with CHPID type = OSC
    - OSC is mutually exclusive with QDIO (OSD), non-QDIO (OSE), OSN and OSM CHPID on the port
  - One or both CHPIDs or ports can be individually configured for Integrated Console Controller
  - Spanned channels allows port(s) sharing among LCSS and LPARs
- Supports Ethernet-attached TN3270E emulated sessions
  - Non SNA DFT (Distributed Function Terminal)
  - Must be TCP/IP RFC (IEEE Standard) 2355 compliant
- Can coexist in configurations using prior IBM 2074 models and older IBM 3174 controllers
- No coaxial cable support (for older tape libraries)
- Configuration support provided via Hardware Management Console

Description - Benefits

- **Simplicity and consolidation**
  - Lower number of components
    - no external controller, displays, ESCON® ports
  - Less configuration
- **Improved availability of controller function**
  - Remote management via HMC
  - Lights out operation possible
  - Hot plug OSAs
- **Scalable capacity**
  - Up to 120 console sessions per CHPID with access to up to all LPARs
  - Shared ICC port via spanned channel support across multiple Logical Channel Subsystems
- **Can provide lower TCO** ... integrated on OSA port(s)
  - No charge function included in LIC and enabled by CHPID definition
  - Can provide lower operating cost - power, cooling, space, administration, no rack, no keyboard/display
- **Potential Personnel Efficiency**
  - Multiple sessions per console can increase user session availability and access
  - Remote user console session capability. **Transport security depends on network VPN**

Pre-OSA ICC Configuration



OSA ICC Requirements

- **z890, z990, z9 BC, z9 EC, z10 BC, z10 EC, z114, z196, zEC12, zBC12**
- **OSA-Express 1000Base-T**
  - Feature Code 1366 (z890, z990, z9 BC and z9 EC)
  - RJ45 Ethernet LAN attachment
- **OSA-Express2 1000Base-T**
  - Feature Code 3366 (z890, z990, z9 BC, z9 EC, z10 BC, z10 EC, z196, z114)
  - RJ45 Ethernet LAN attachment
- **OSA-Express3 1000Base-T**
  - Feature Code 3367 (z10 BC, z10 EC, z196, z114, zEC12, zBC12)
  - Feature Code 3369 (z10 BC, z114 only)
  - RJ45 Ethernet LAN attachment
- **OSA-Express4S 1000Base-T**
  - Feature Code 0408 (zEC12, zBC12)
  - RJ45 Ethernet LAN attachment
- **OSA-Express5S 1000Base-T**
  - Feature Code 0417 (zEC12, zBC12)
  - RJ45 Ethernet LAN attachment
- **Operating Systems**
  - z/OS, z/VM, VSE, TPF
- **TN3270E clients**

Defining OSA ICC – HCD / IOCP

```
RESOURCE
  PARTITION=((CSS(0),(A0A,A),(A0B,B),(A0C,C),(A0D,D),(A0E,E),(A0F,F)
  ,(A01,1),(A02,2),(A03,3),(A04,4),(A05,5),(A06,6),(A07,7),(A08,8),(
  A09,9)),(CSS(1),(A1A,A),(A1B,B),(A1C,C),(A1D,D),(A1E,E),(A1F,F),(A
  11,1),(A12,2),(A13,3),(A14,4),(A15,5),(A16,6),(A17,7),(A18,8),(A19
  ,9))),  MAXDEV=((CSS(0),64512),(CSS(1),64512))


CHPID
  PATH=(CSS(0),07),SHARED,PARTITION=((A0A,A0B,A0C,A01,A02,A03,A04,A0
  5,A06,A07,A08,A09),(=)),PCHID=380,TYPE=OSC
CHPID
  PATH=(CSS(1),07),SHARED,PARTITION=((A1A,A1B,A11,A12,A13,A14,A15,A1
  6,A17,A18,A19),(=)),PCHID=381,TYPE=OSC


CNTLUNIT CUNUMBR=E200,PATH=((CSS(0),07)),UNIT=OSC
IODEVICE ADDRESS=(E200,120),MODEL=X,CUNUMBR=(E200),UNIT=3270
CNTLUNIT CUNUMBR=E300,PATH=((CSS(1),07)),UNIT=OSC
IODEVICE ADDRESS=(E300,120),MODEL=X,CUNUMBR=(E300),UNIT=3270
```

Defining OSA ICC - Options

- **Defer Host Disconnect (DHD)**
  - Indicates the amount of time to wait (in seconds) until OSA-ICC tells the host that the client session has disconnected. Affects if and when the OSA-ICC server notifies the host operating system that OSA-ICC port communications to a z/OS MCS console session has been lost.
- **Response Mode (RSP)**
  - If enabled, the host waits for the client to send an acknowledgement on the Telnet level for every read, write, or packet it receives. This enables the user to check for bad LANs, poor performance, or other issues.
- **Read Time Out (RTO)**
  - When Response Mode is enabled, specifies how long to wait (in seconds) for a response from the client before performing a client disconnect. The default RTO is 60. The valid range for RTO is 1-300.

Defer Host Disconnect

1. Disable
   - Immediately notify host OS of a disconnect
   - After reconnecting, a manual Vary on-line (at an alt zOS Ops Console) must be performed to reconnect the Session.
2. Enable with defaulted deferment of 60 seconds
   - Wait for 60 seconds before notifying host OS
     - If reconnected within 60 seconds, simulate a “3270 Clear key”
     - z/OS MCS console support will reformat the screen and continue
3. Enable with no timeout for deferment
   - Never notify the host OS (will leave in disc state)
4. Enable with user specified defaulted deferment
   - Same as #2 with a different time value

Response Mode (RSP)

- When enabled, each 3270 data stream frame sent from the OSA-ICC Host server to the TN3270E client display is **ack**nowledged by the TN3270E client display session back to the OSA-ICC server
- May affect session performance
- Might be useful in diagnosing Ethernet LAN connectivity issues.

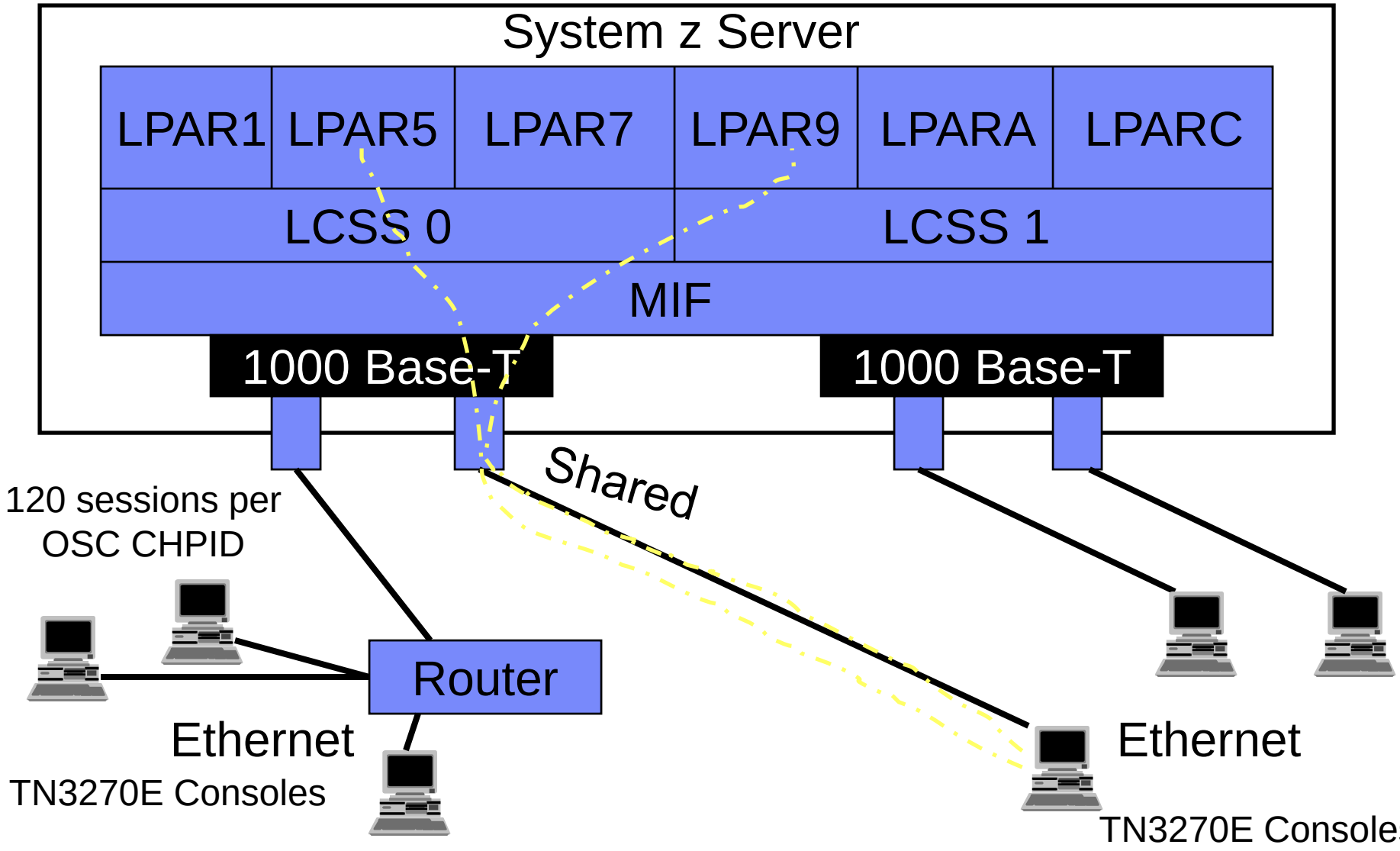
Read Time Out (RTO)

- OSA-ICC Host Server waits up to the amount of time specified by the RTO value for the TN3270E client session to acknowledge
  - If expired, “disconnect” and inform host
  - Read CCW, Write CCW, Acknowledgement packets
    - **Tied to the RSP (Response Mode) setting – (Enabled)**
- If the Ethernet LAN is busy/slow, increasing this value may prevent unexpected session drops.
- Increasing the RTO value increases the time it takes for the operating system to detect the client session has gone away.
- 1, 10 (default), 60 seconds or user specified

Notes: 1. If No RTO, Disable Missing Interrupt Handler (MIH).

2. If RTO is specified, make MIH 50% greater than RTO

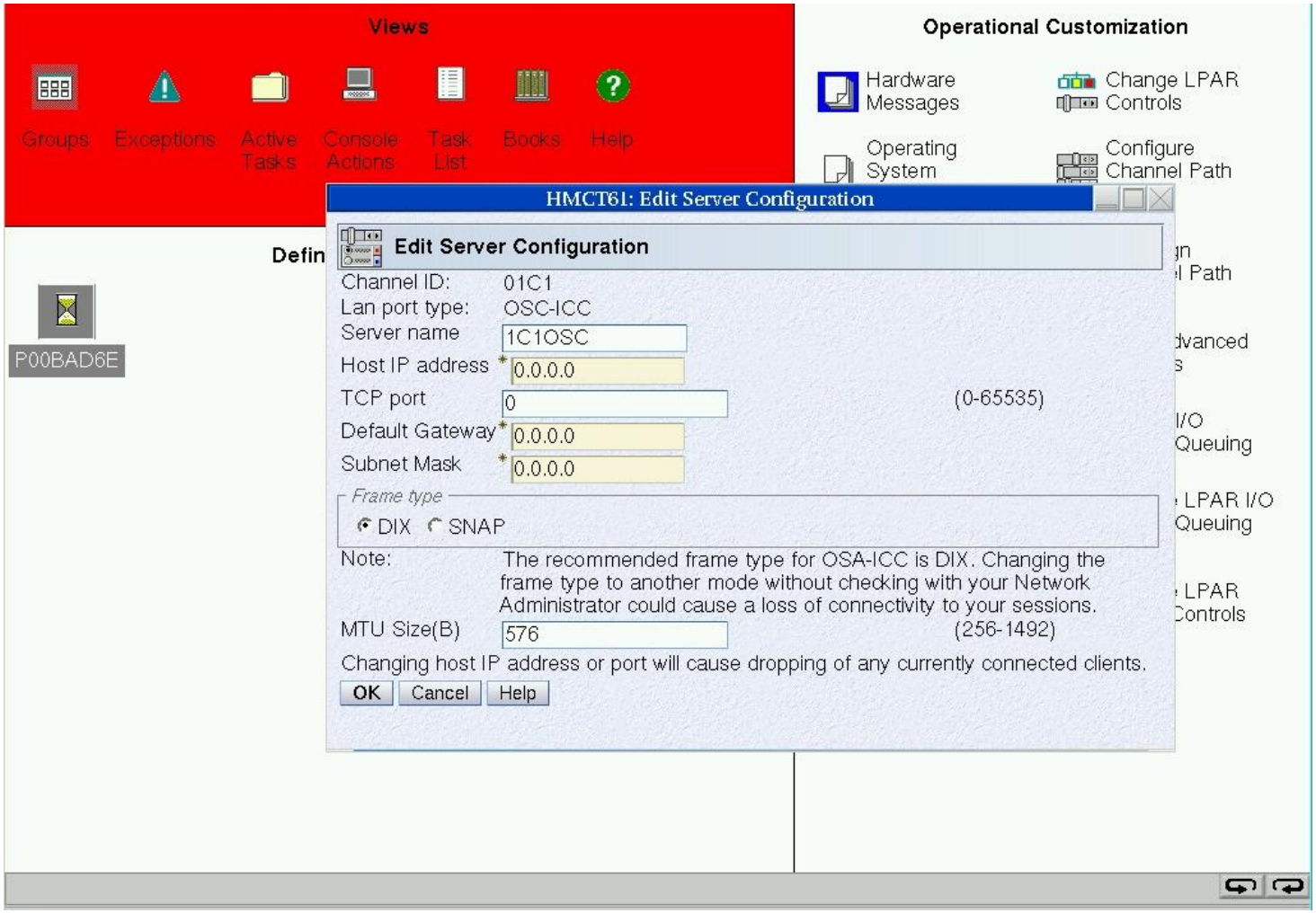
OSA Express and OSA Express 2 - 1000BaseT



OSA Express and OSA Express 2 - Adapter Port Setup Example

- The OSC channel must be physically installed and the CHPID defined as CHPID Type OSC in the HCD for the Logical Partition
- The OSA Adapter is configured as seen in the following steps on the Hardware Management Console through Single Object Operation to the Support Element using the OSA Advanced Facilities Icon to configure, validate and activate the OSA ICC Sessions for the OSC CHPIDs
- Configure the PCOM sessions in each Workstation
- Defining Consoles/Printers to the Host Operating System

OSA Express and OSA Express 2 - Adapter Port Setup - OSA Advanced Facilities - Server Configuration

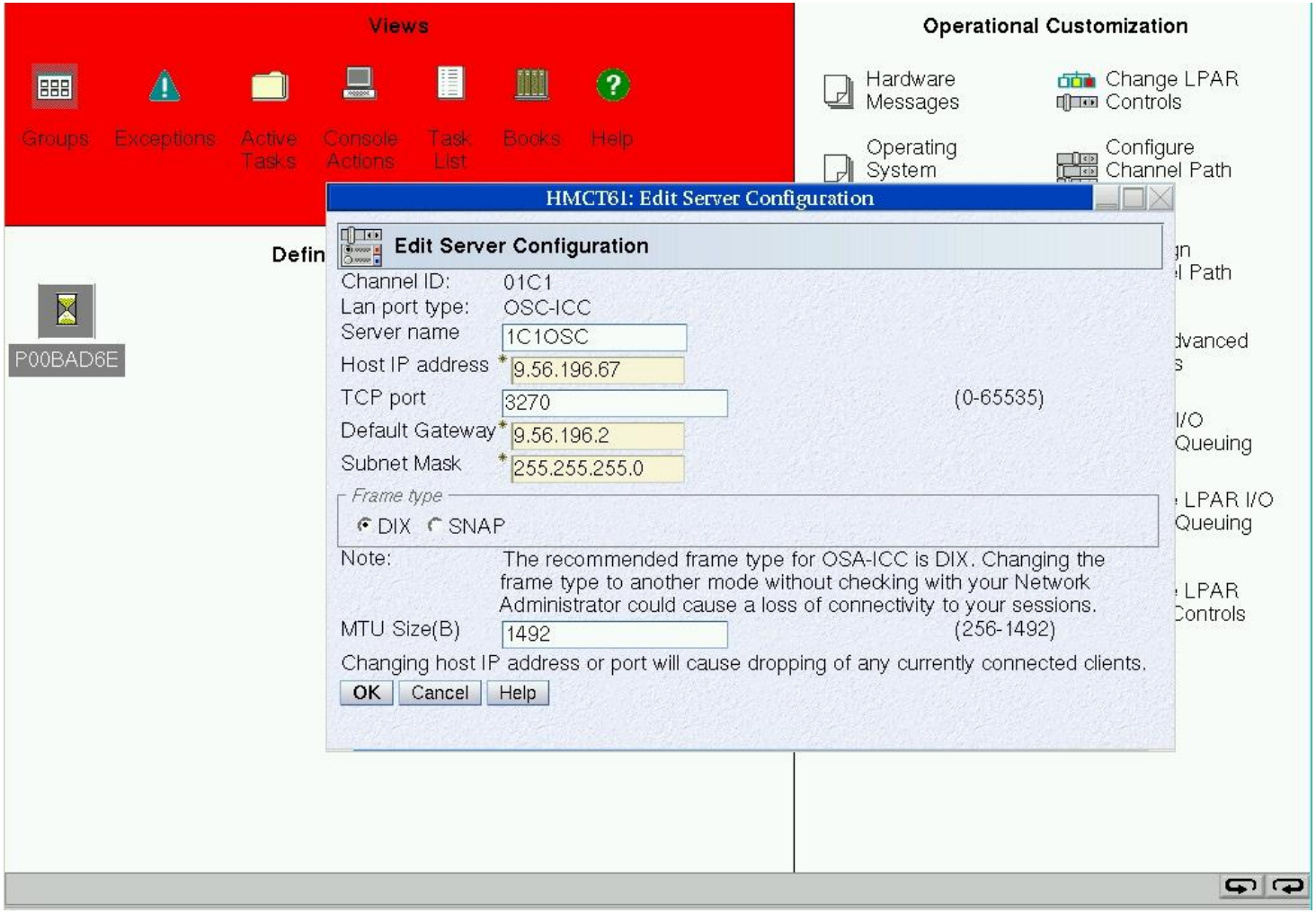


OSA Express and OSA Express 2 - Adapter Port Setup - OSA Advanced Facilities - Server Configuration

- **Server Name** - Specifies the name of the server to which a client is connected.
- **Host IP Address** - Is the IP address of the OSA CHPID on the LAN
- **TCP Port** - Specifies the port that the server will use to connect with the client.
- **Default Gateway** - Specifies IP address gateway to any machines out of network.
- **Subnet Mask** - Specifies a mask used to determine the subnet to which an IP address belongs.
- **Frame type** - Specifies the Ethernet standards that you want the network to follow. Every host in a network must have the same frame type. Most traffic on Ethernet is usually carried on DIX (802.3) frames. Please contact your network administrator to see what you are using.
- **MTU Size(B)** - Specifies the maximum size to be transferred in one frame. A valid range is from 64–1492. A user would use an MTU size of less than 1492 when the routing equipment does not support 1492.

OSA Express and OSA Express 2 - Adapter Port Setup - OSA Advanced Facilities - Server Configuration

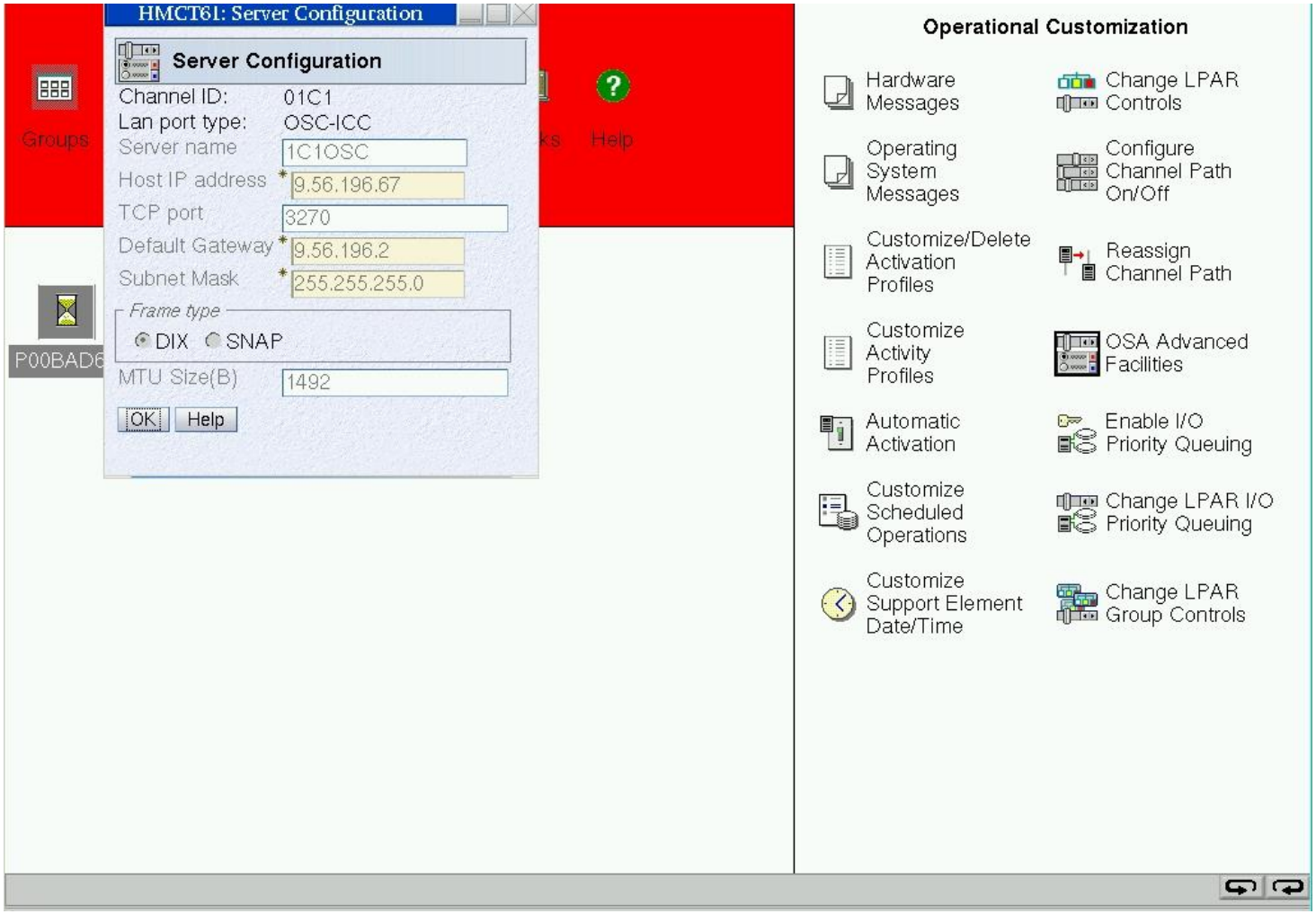
The Host Address IP is the IP address of the OSA CHPID on the LAN



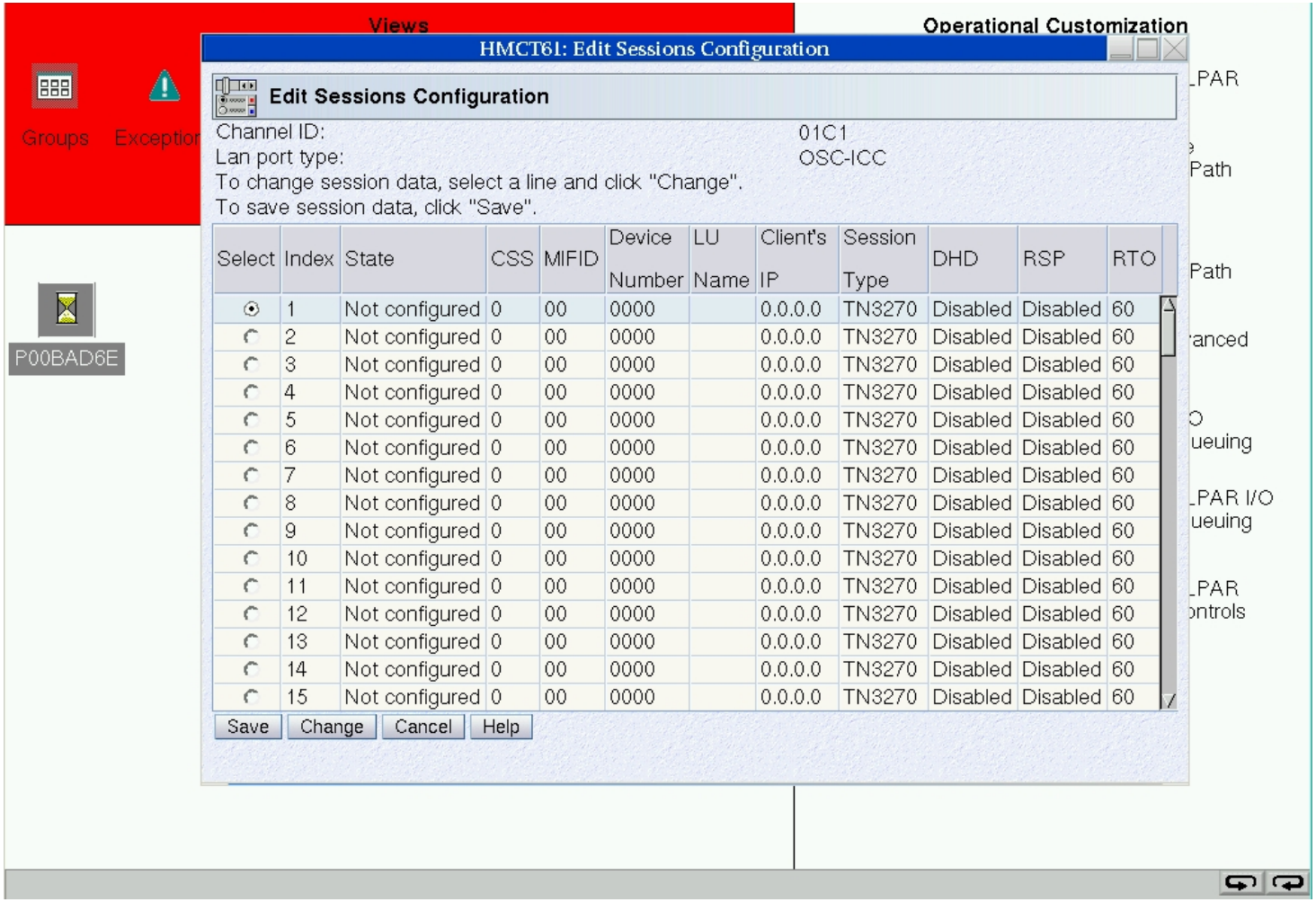
ATTENTION !! !! !!

- Changing any of the server configuration definitions, other than Server Name, will result in all sessions currently connected through this OSA-ICC port to be dropped, when the validated configuration is next ***activated***.
- Clicking **OK** on the Edit Server Configuration panel *will not* drop sessions.

OSA Express and OSA Express 2 - Adapter Port Setup - OSA Advanced Facilities - Server Configuration



OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration

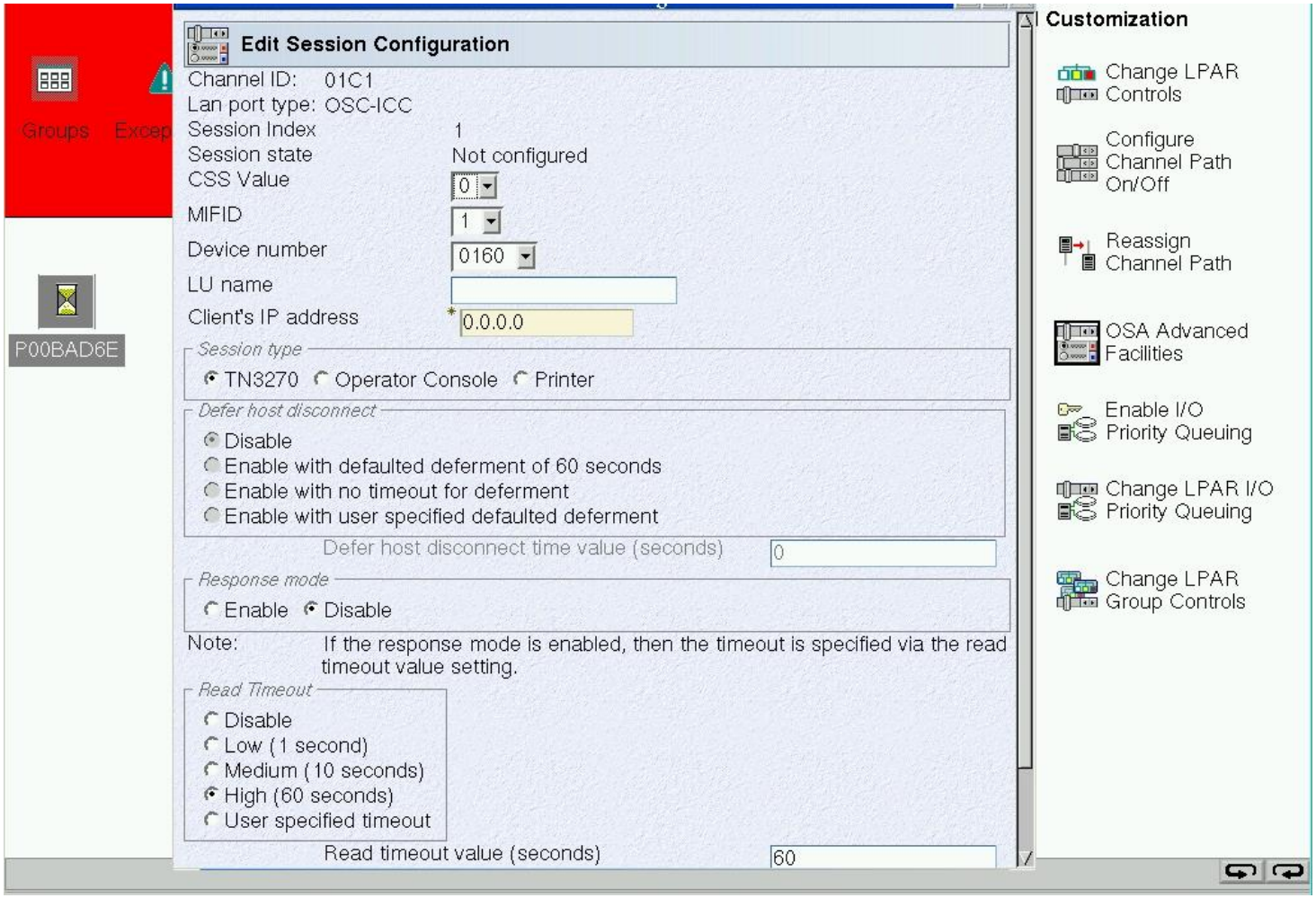


OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration

- **Index** - Specifies the session number
- **State** - Specifies whether the session is not configured, available, or has a definition error
- **CSS** - Specifies the logical channel subsystem (LCSS) ID number. Valid range for CSS is 0–3.
- **MIFID** - Is the logical partition MIF image ID. It specifies the logical partition within the LCSS with which the device will communicate. Valid range for the Image ID is 1–F.
- **Device Number** - Is a number assigned for each device. A valid range for the device number is 0-65535.
- **LU Name** - Defines a group pool of devices. Identifies what session you are going to connect to.
- **Client's IP** (optional) - Specifies the IP address that client will use to connect to the session. The client's IP address can remain 0.0.0.0 or empty in order to allow any client to connect to a specific session.
- **IP Filter** (optional) - Defines a range of IP addresses that can connect to the session. Clients IP addresses that match the range of the IP filter will be allowed to connect. Clients with IP addresses outside the range of the IP_FILTER requesting to connect will be refused a connection.This field is assigned the value 255.255.255.255 by default.
- **Session Type** - Can be TN3270, operating system console, or printer. The default is the operating system console.

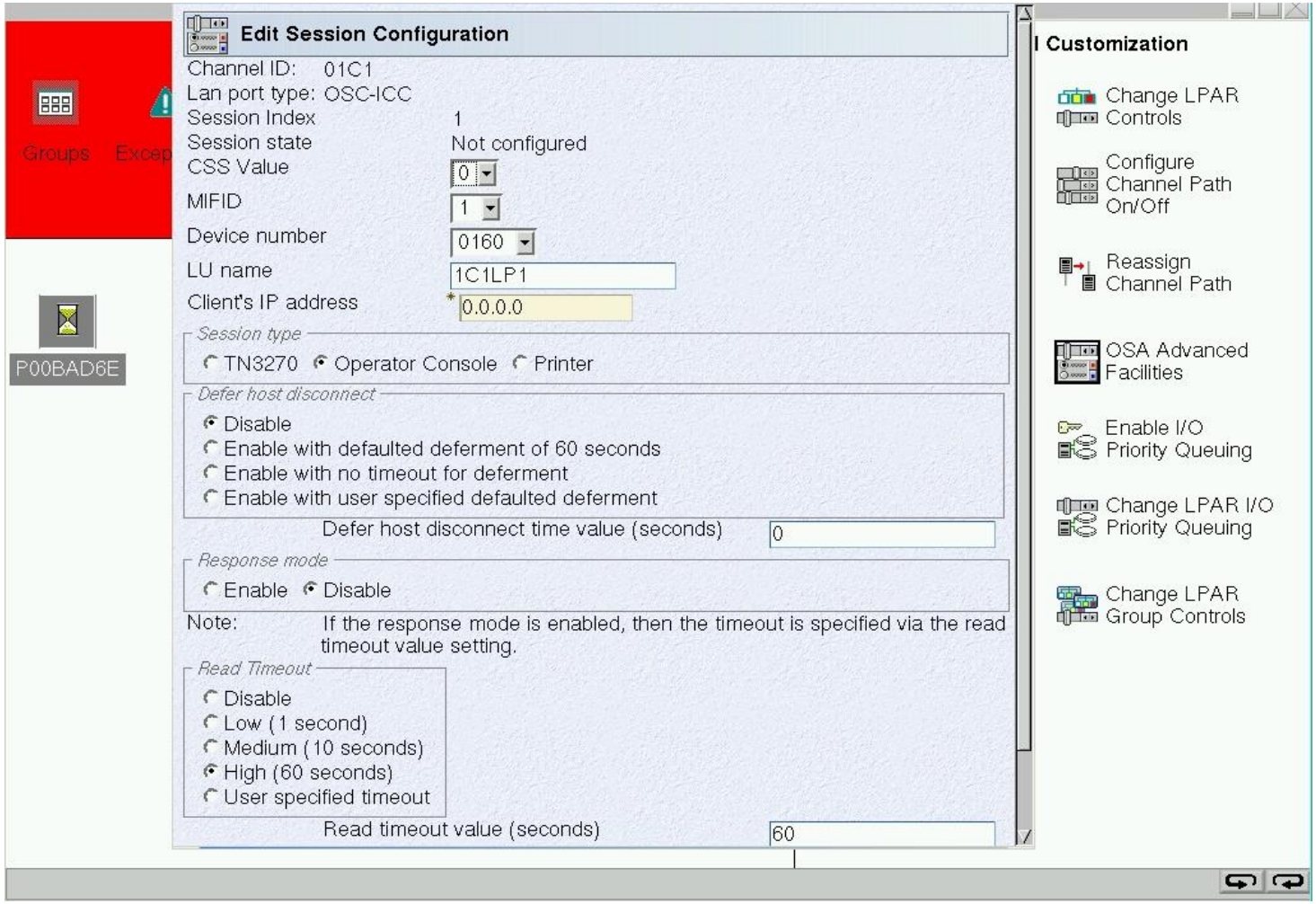
OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration

Client IP address would be assigned IF you were assigning a static IP address to your workstation to ensure that only that workstation will use this device number.



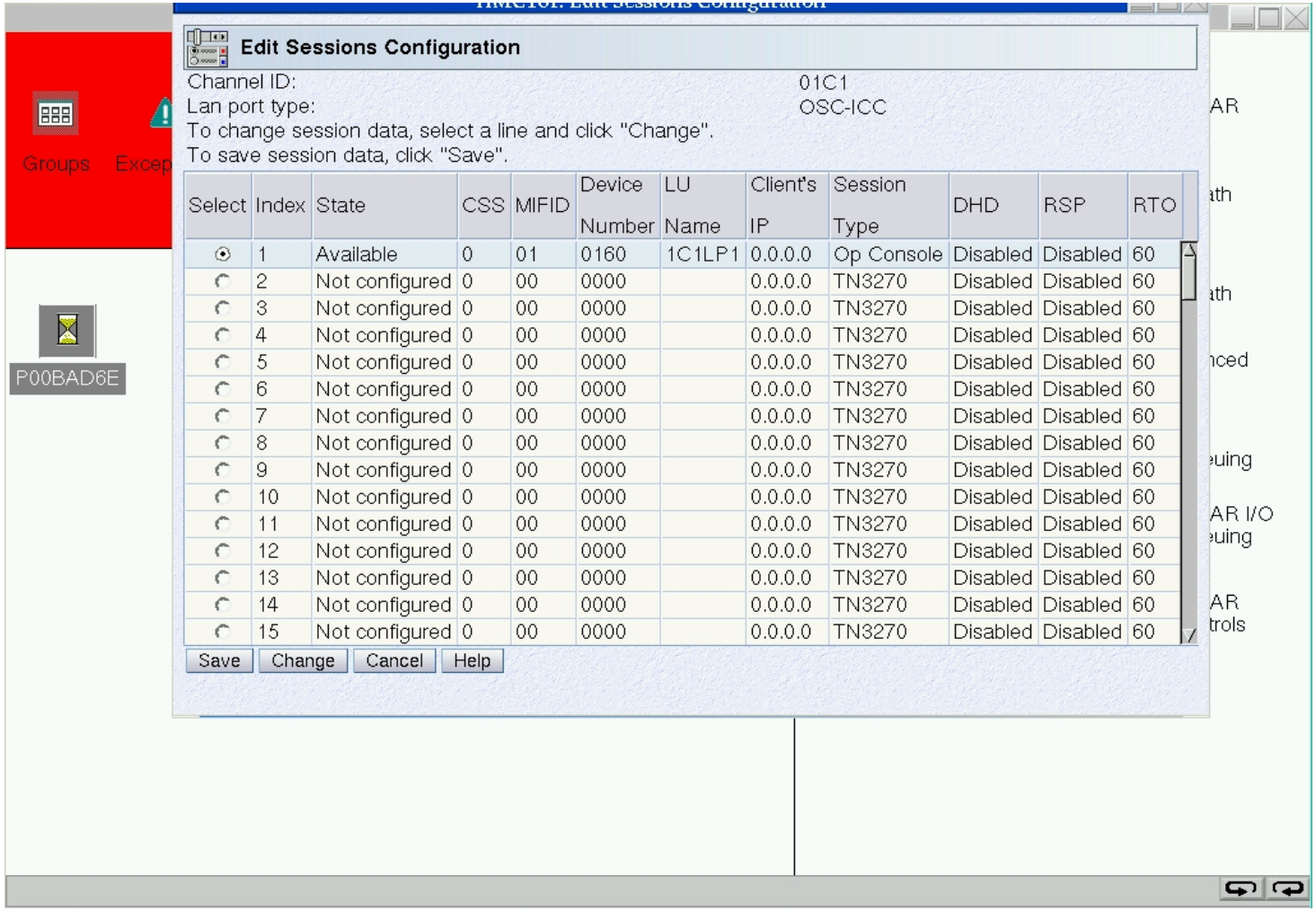
If using DHCP to assign workstation IP addresses, then Client IP address cannot be used.

OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration

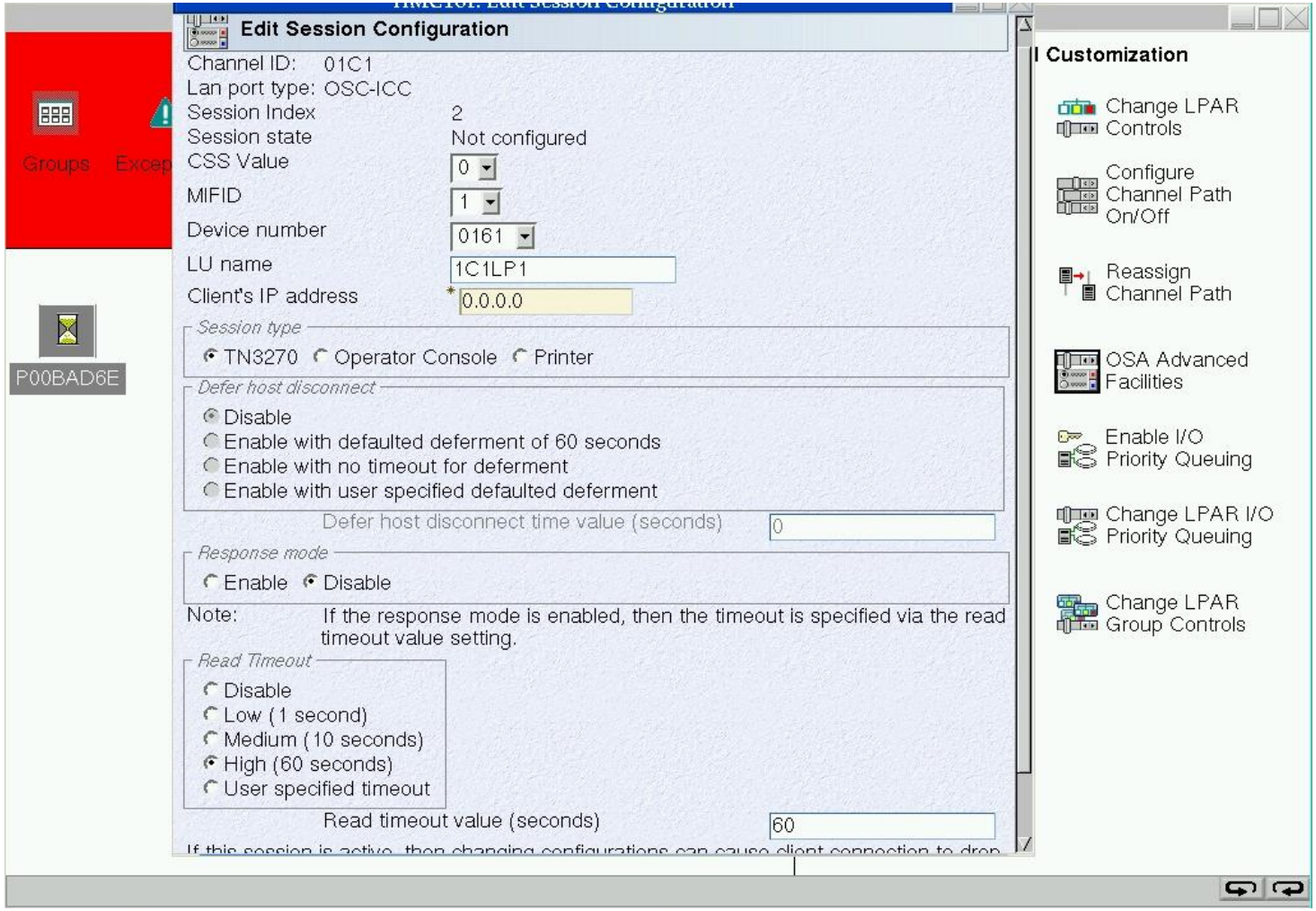


Must assign the LUNAME which will match the LUNAME also assigned in the PCOM session.

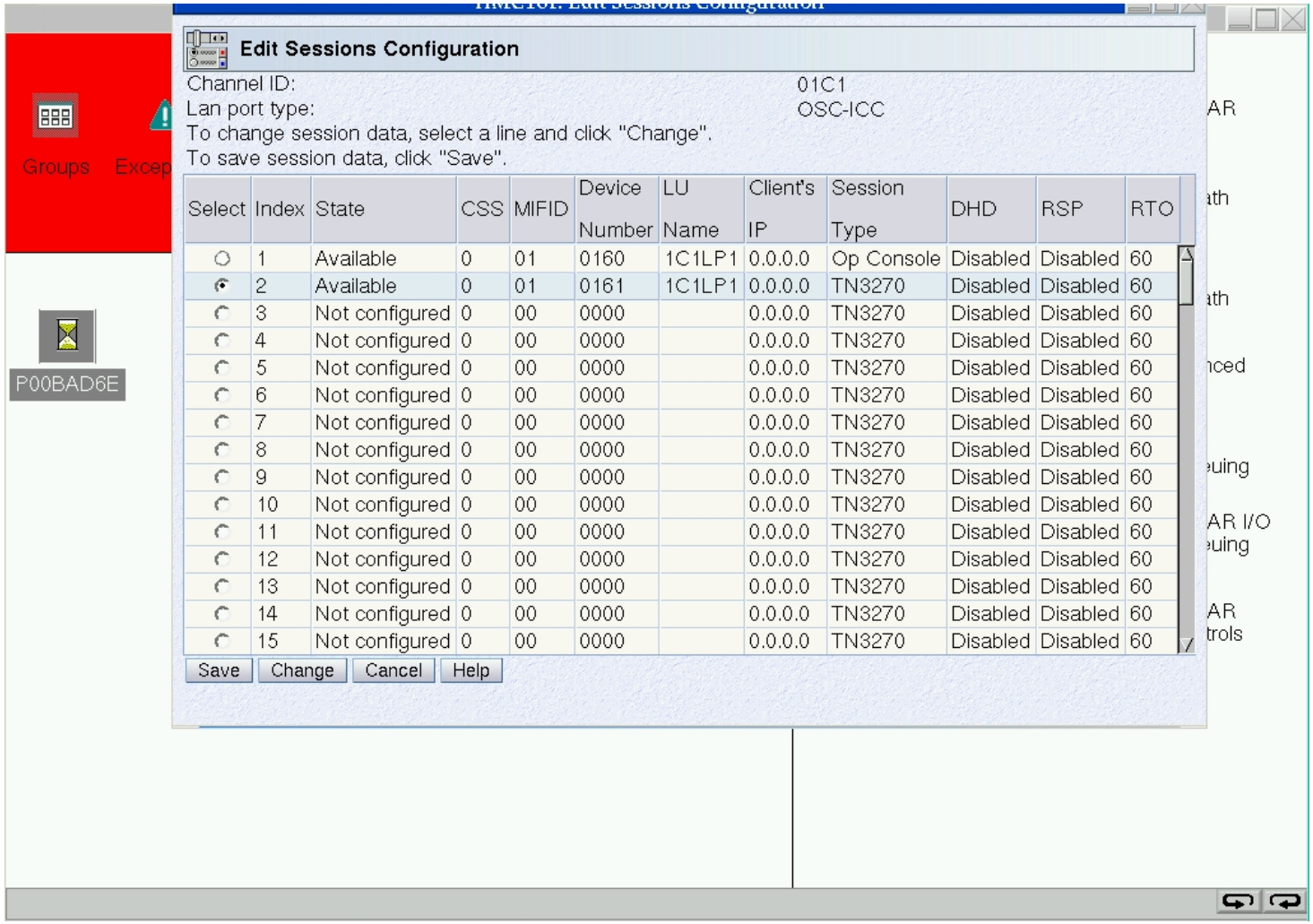
OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration



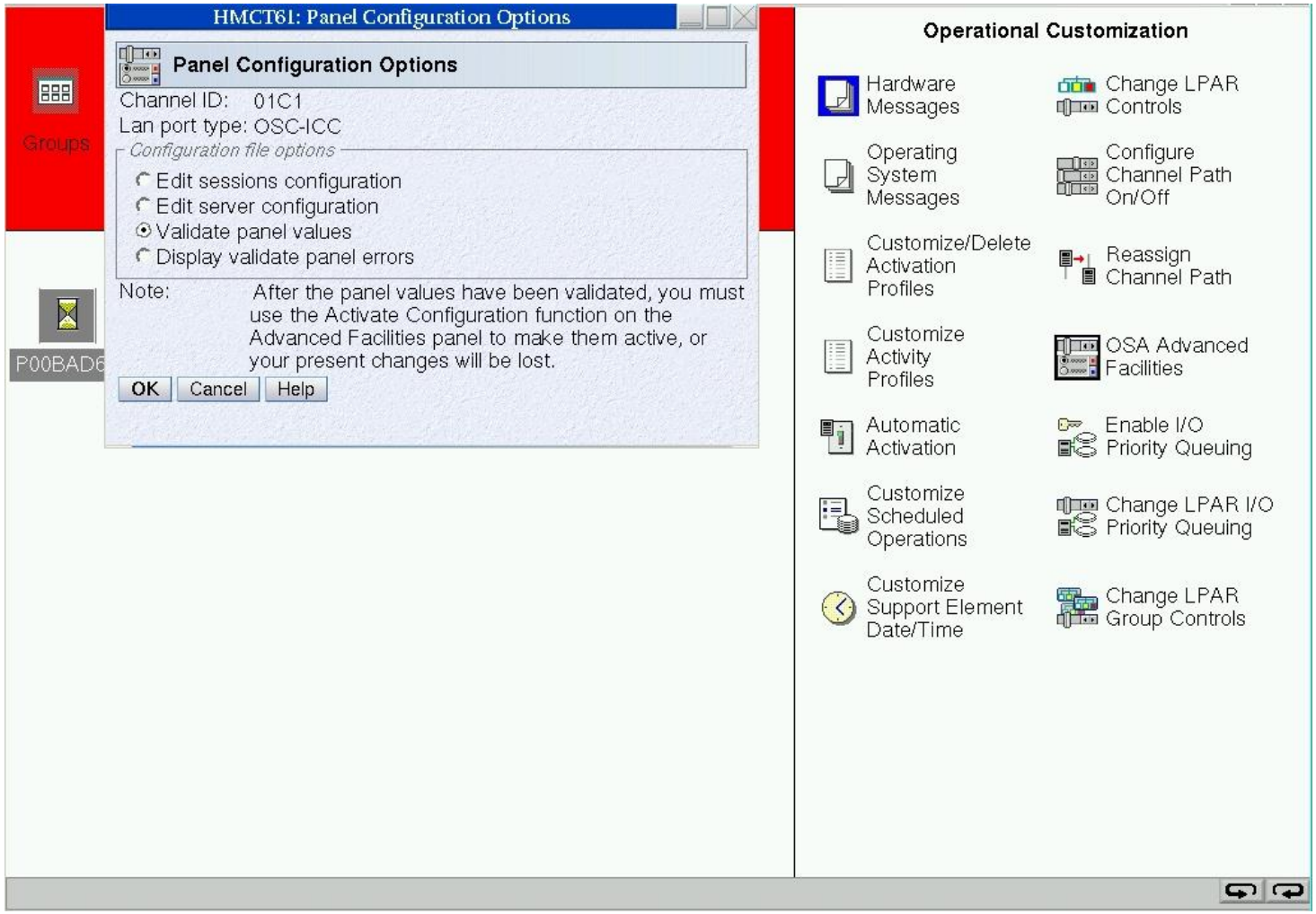
OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration



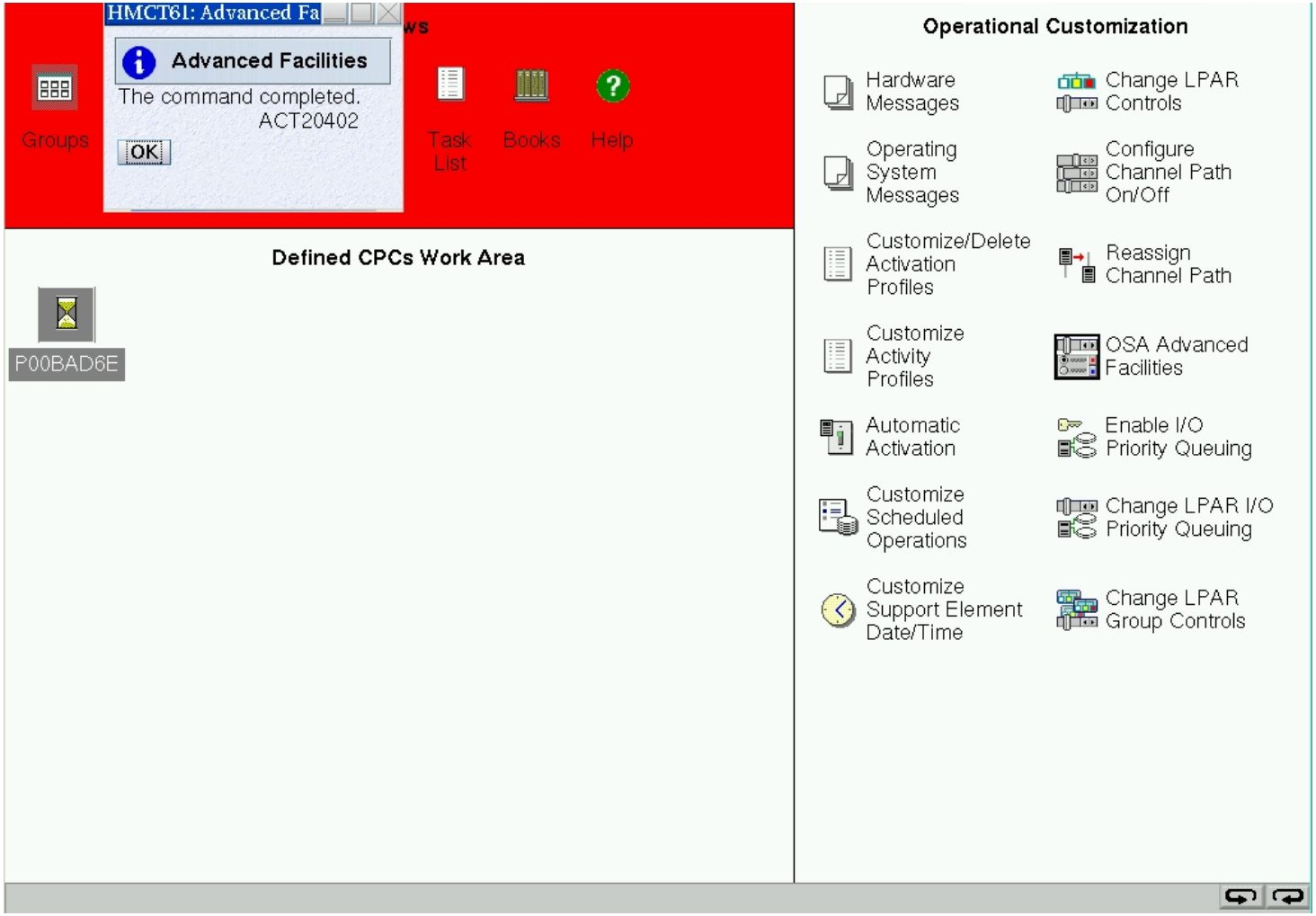
OSA Express and OSA Express 2 - Sessions Setup - OSA Advanced Facilities – Edit Sessions Configuration



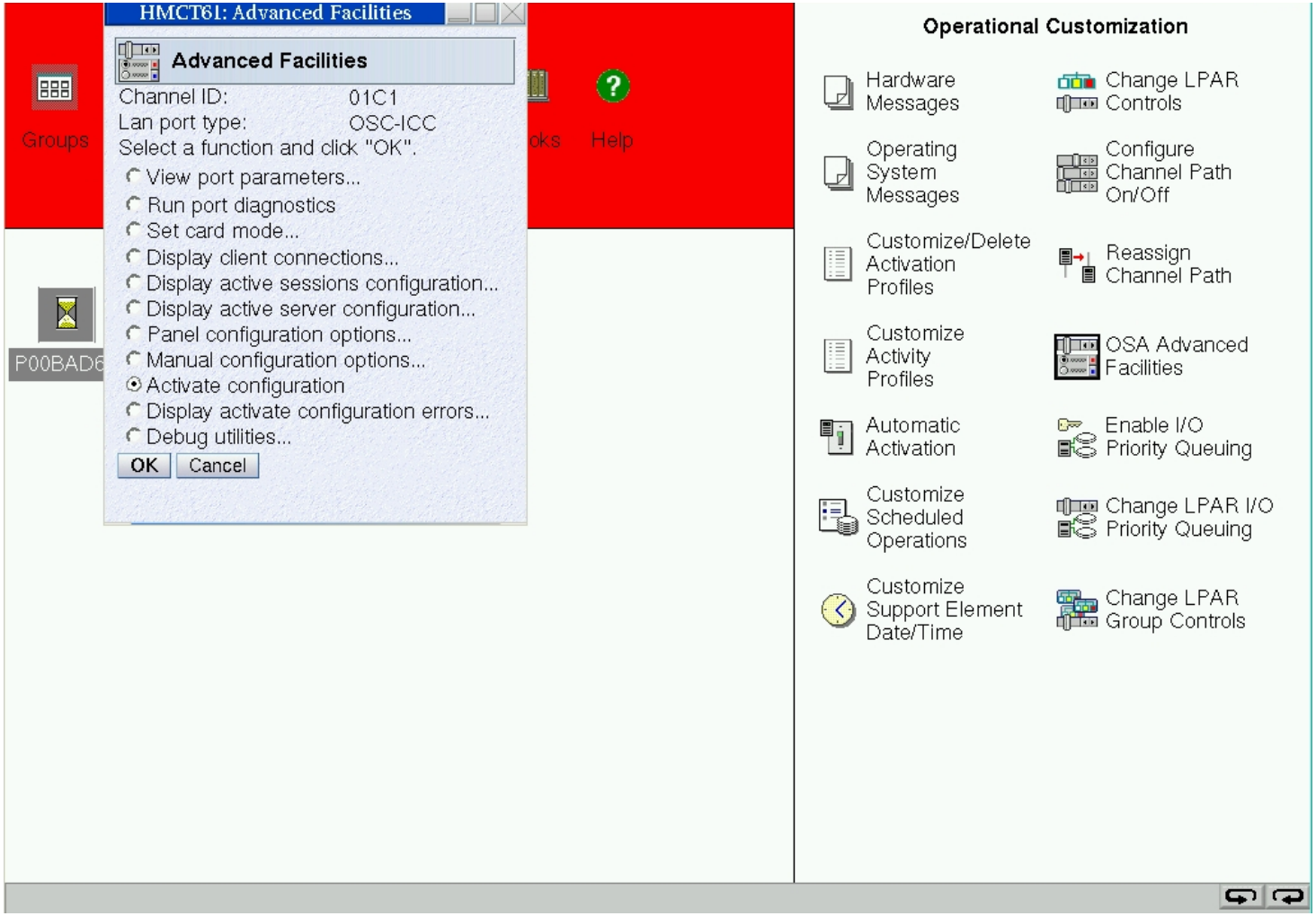
OSA Express and OSA Express 2 - OSA Advanced Facilities – Validate Panel Values



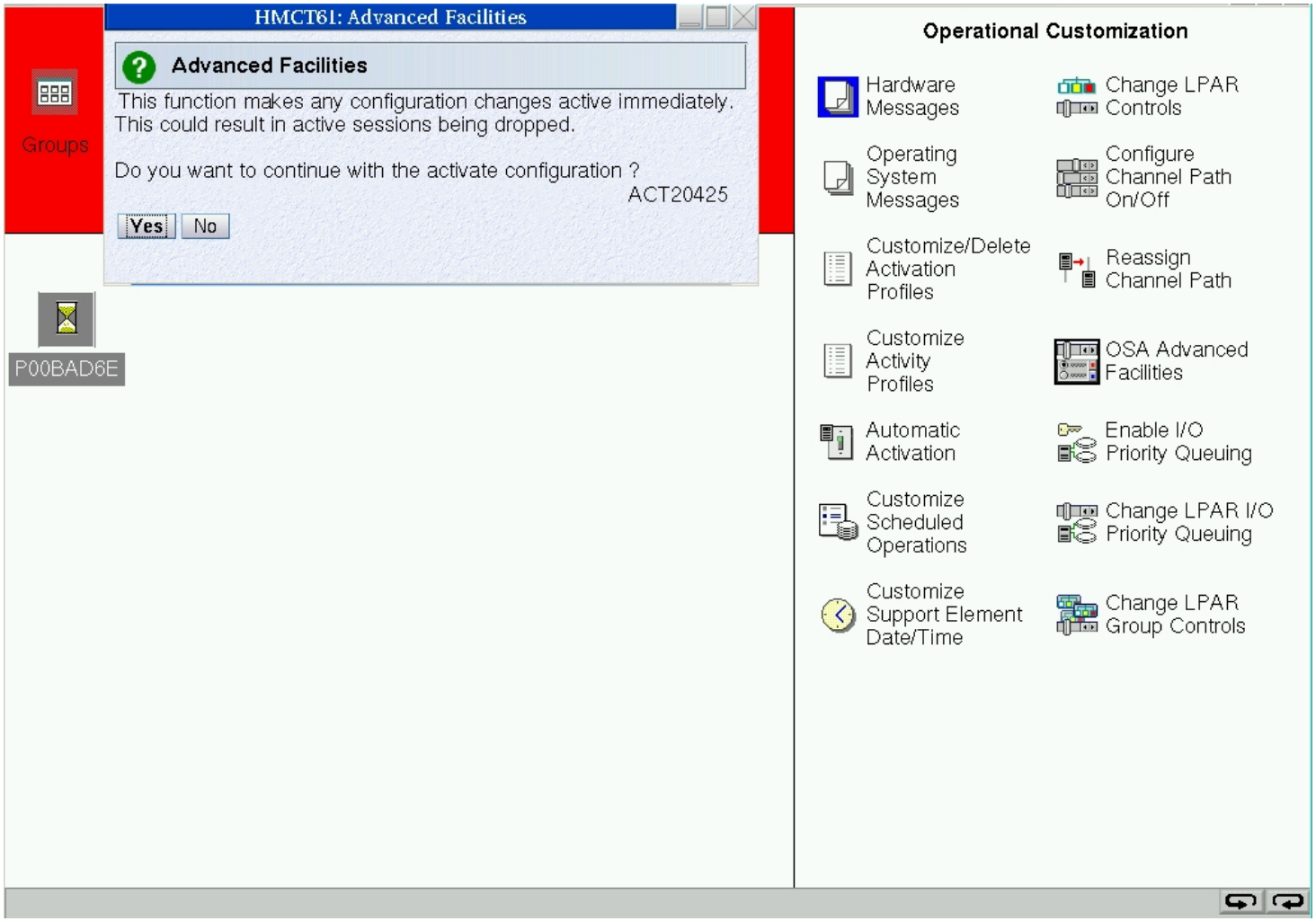
OSA Express and OSA Express 2 - OSA Advanced Facilities – Validation Completed



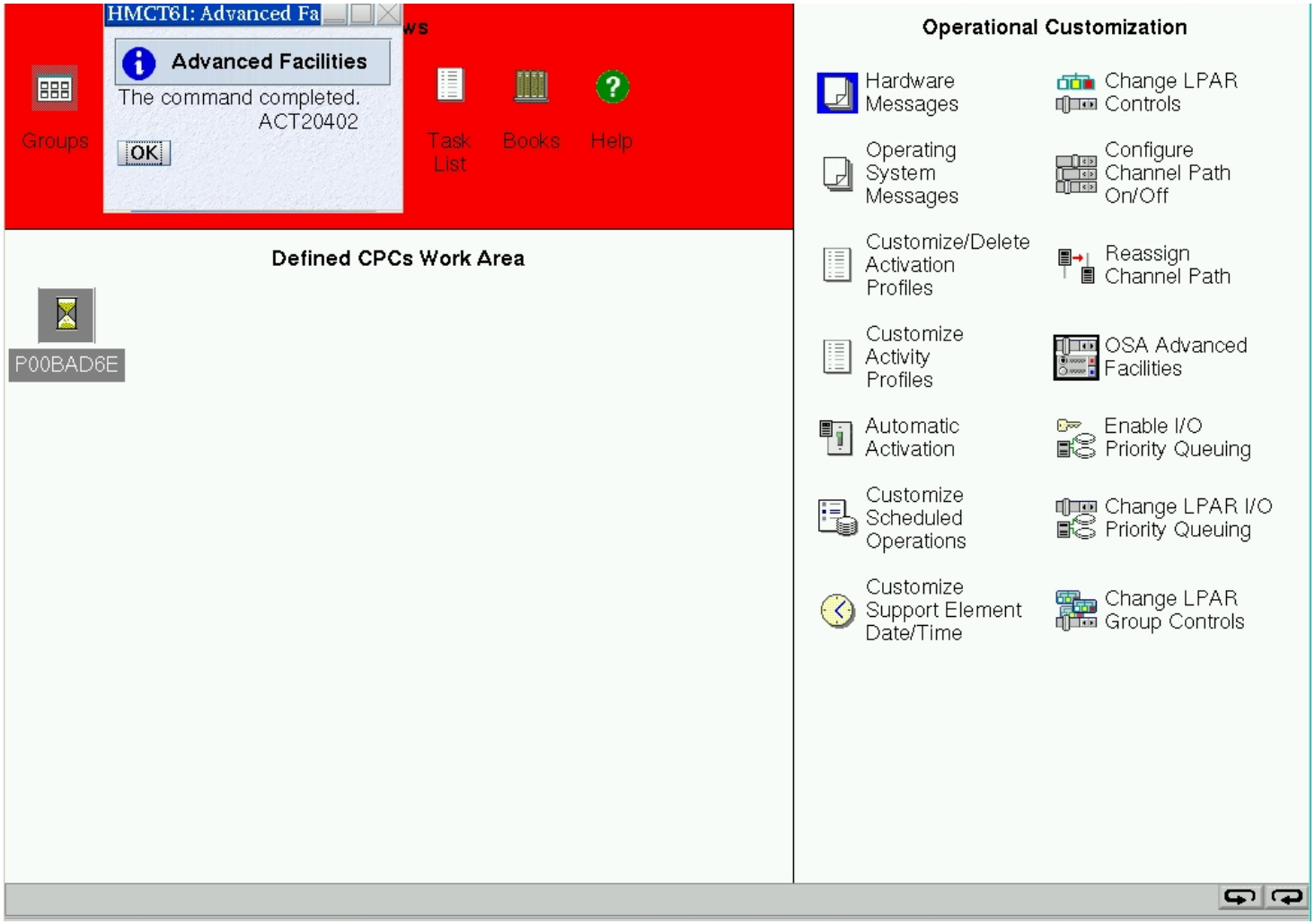
OSA Express and OSA Express 2 - OSA Advanced Facilities – Activate Configuration - DISRUPTIVE !!!



OSA Express and OSA Express 2 - OSA Advanced Facilities – Activation Confirmation



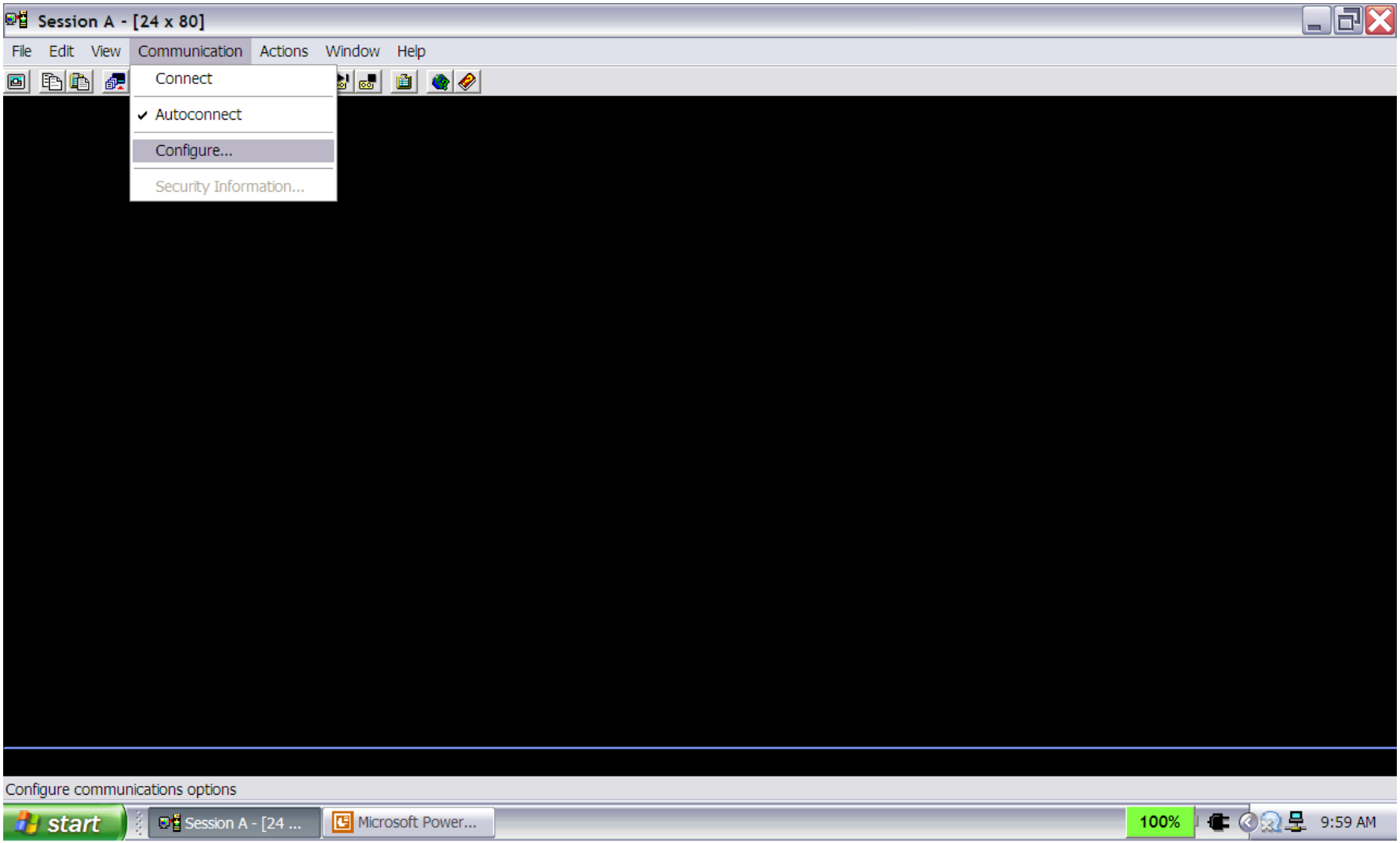
OSA Express and OSA Express 2 - OSA Advanced Facilities – Activation Completed



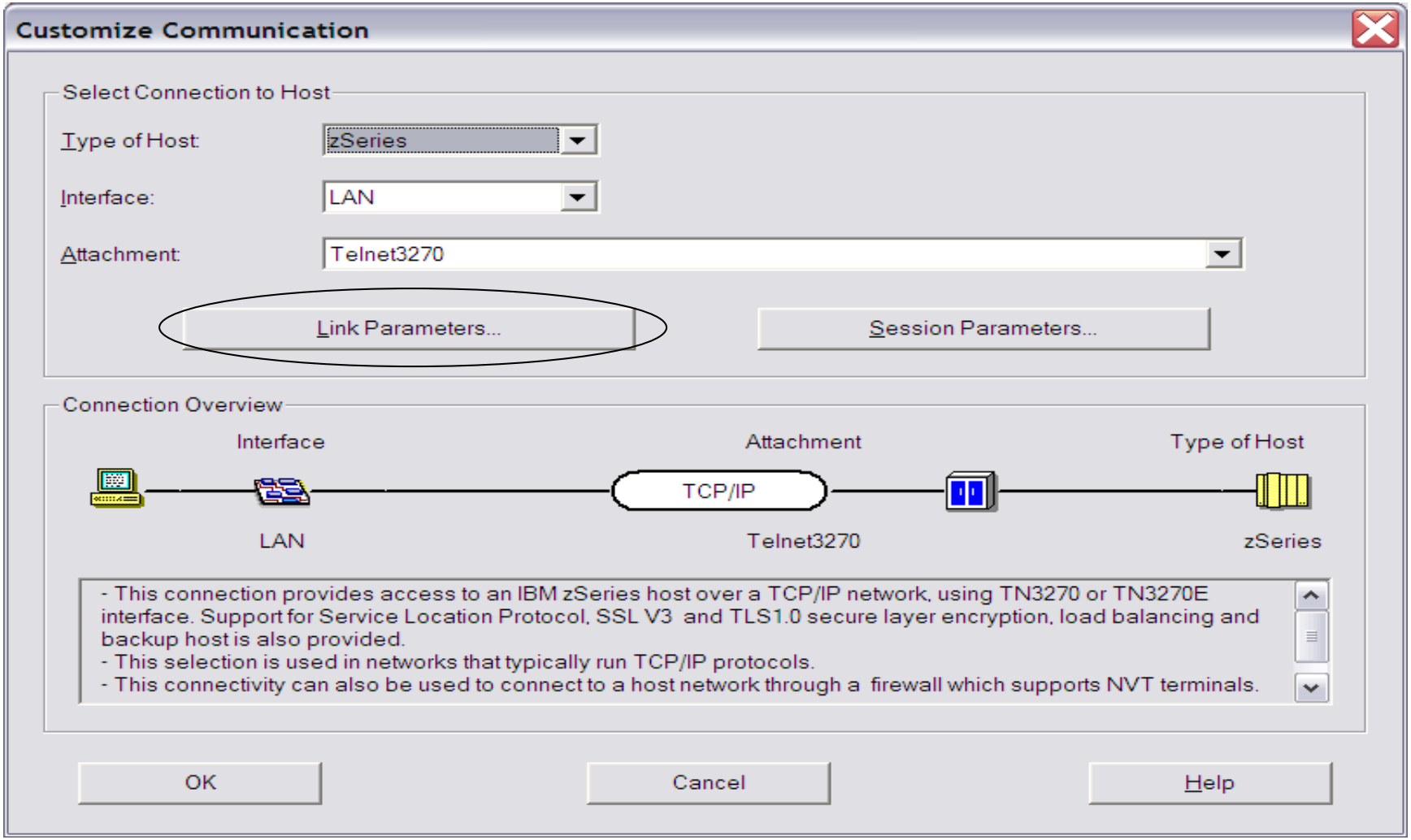
PCOM Session – Workstation Setup

- PCOM session is established to the OSA ICC channel via the server (CHPID) IP address
- Goes to TCPIP stack in the OSA-ICC channel
- Does not go into the operating system TCPIP stack
- zOS, zVSE, zVM, TPF (TCPIP stacks) are not involved

PCOM Session – Workstation Setup

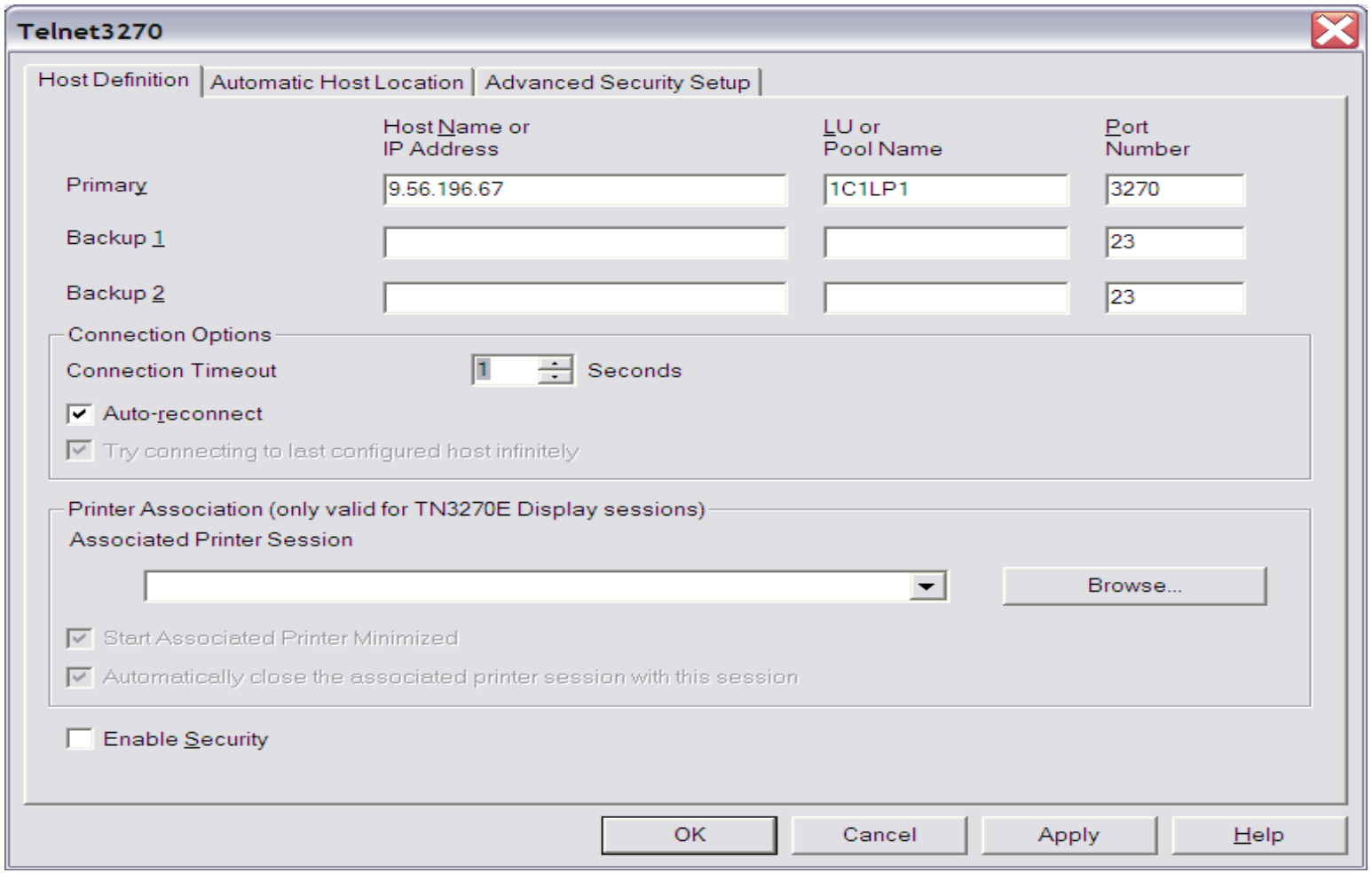


PCOM Session – Workstation Setup



PCOMM Setup

Must assign the Host Name IP address and TCP Port Number which match the Edit Server Configuration values (page 17) and the LUNAME which matches the Edit Session value (page 23) for each PCOM Session.

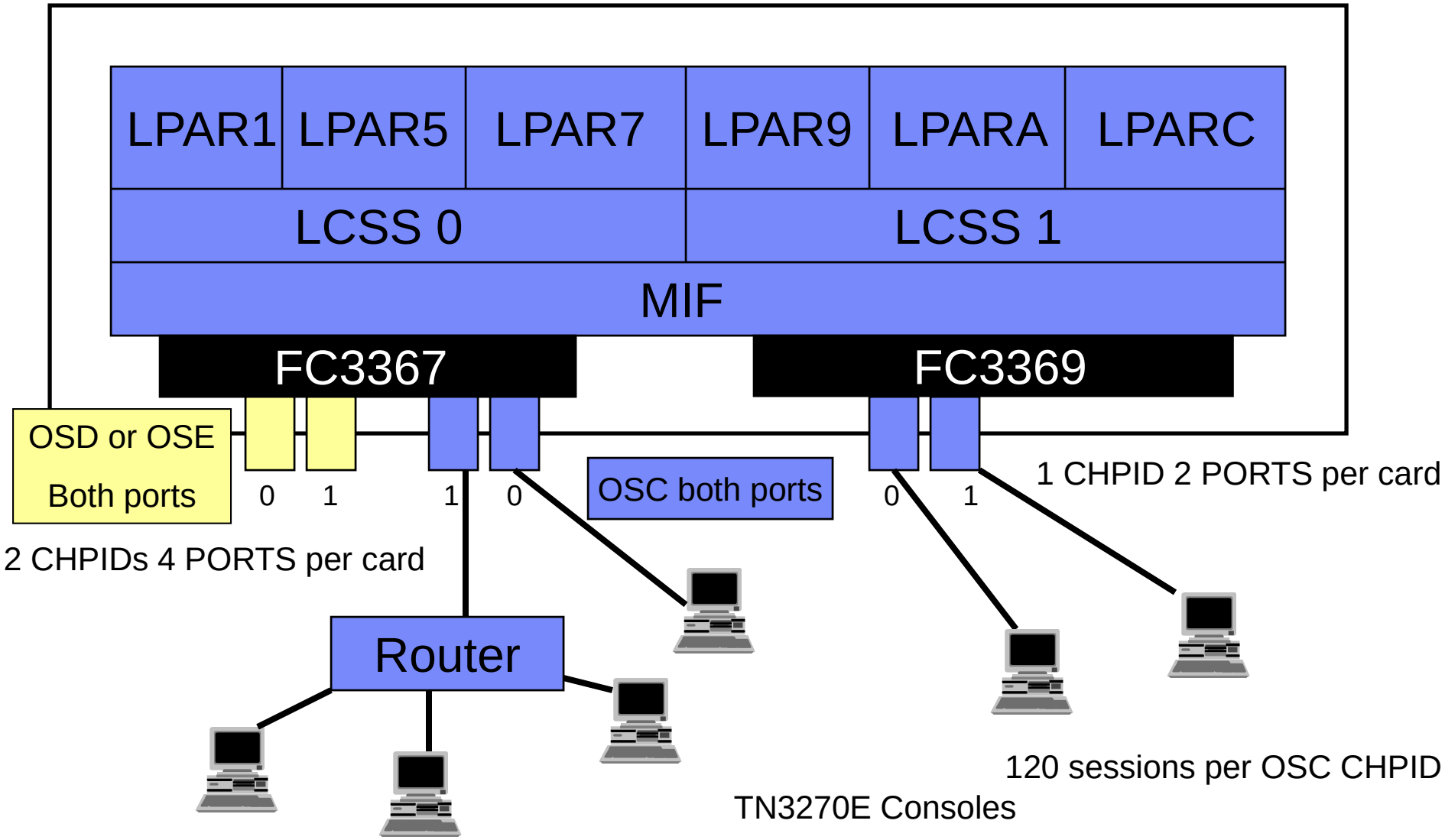


Tip: Auto-reconnect recommended

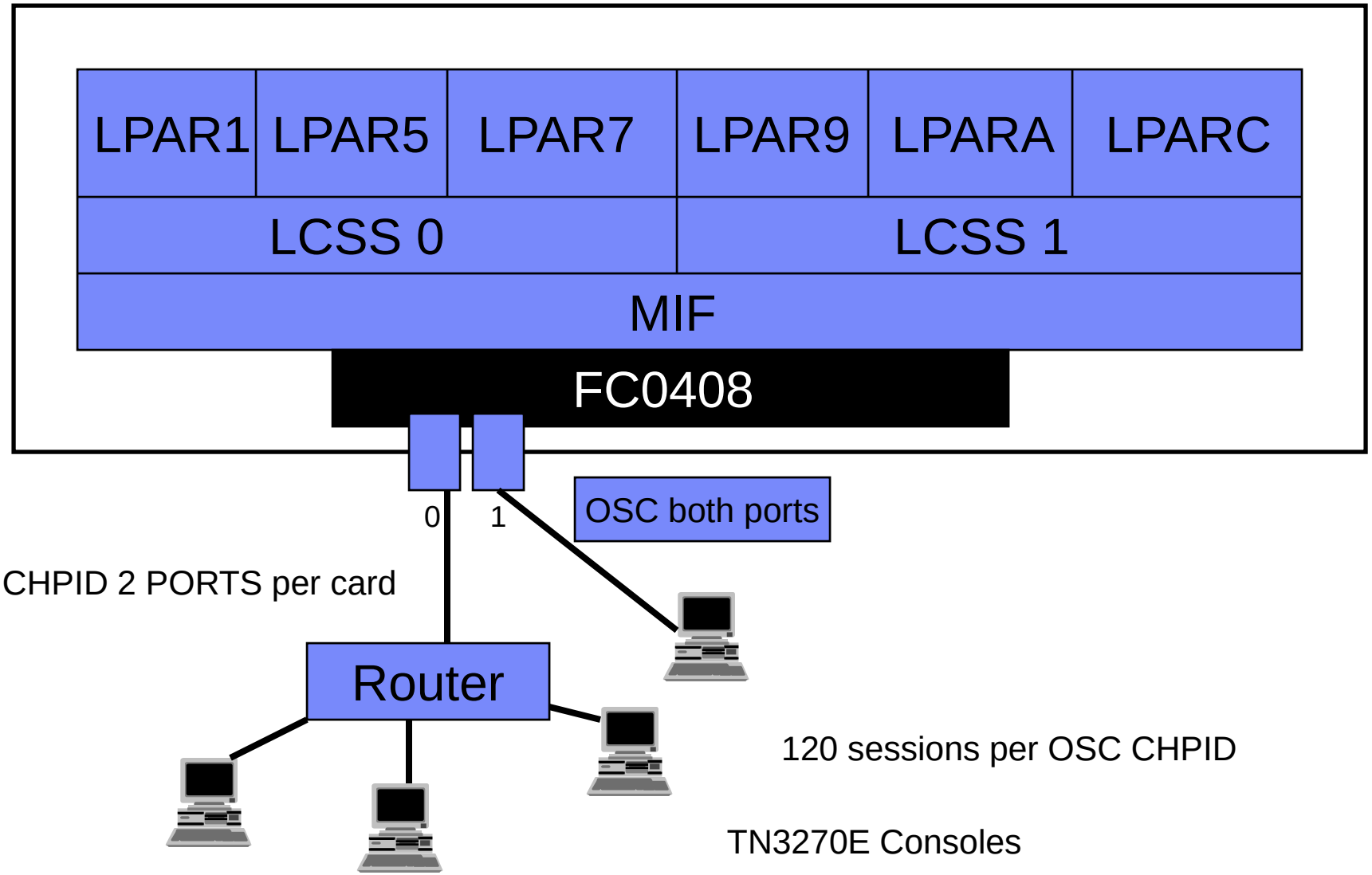
Defining Consoles/Printers to the Host Operating System

- **z/OS**
  - NIP and MCS consoles are defined in the same way as those that are attached via IBM 2074 or 3174.
  - NIP consoles are defined using HCD
  - MCS consoles are defined in the CONSOLEXX member of the SYS1.PARMLIB dataset.
  - In this setup example, this matches the device number 0160 on page 26.
  - 328x emulated printer associated with the MCS output-only console, directs the output to the MCS workstation USB attached ink-jet printer
- **zVM**
  - IPL consoles and RSCS printer support for 328x printers are defined in the same way as consoles and printers attached via IBM 2074 or 3174 in the system configuration (SYSTEM CONFIG) file on the primary parm (MAINT CF1) disk
- **VTAM**
  - Local non-SNA DFT 3270 sessions are defined in the same way as sessions attached via IBM 2074 or terminals attached via IBM 3174, in the local non-SNA major node (MAJNODE) member of the SYS1.VTAMLST data set.
  - In this setup example, this matches the device number 0161 on page 26.
- **For more information about defining Host Operating System Consoles refer to SG24-6364 OSA-Express Integrated Console Controller Implementation Guide**

OSA-Express3 - Dual Port Connectivity – 1000BaseT



OSA-Express4S/5S - Dual Port Connectivity – 1000BaseT



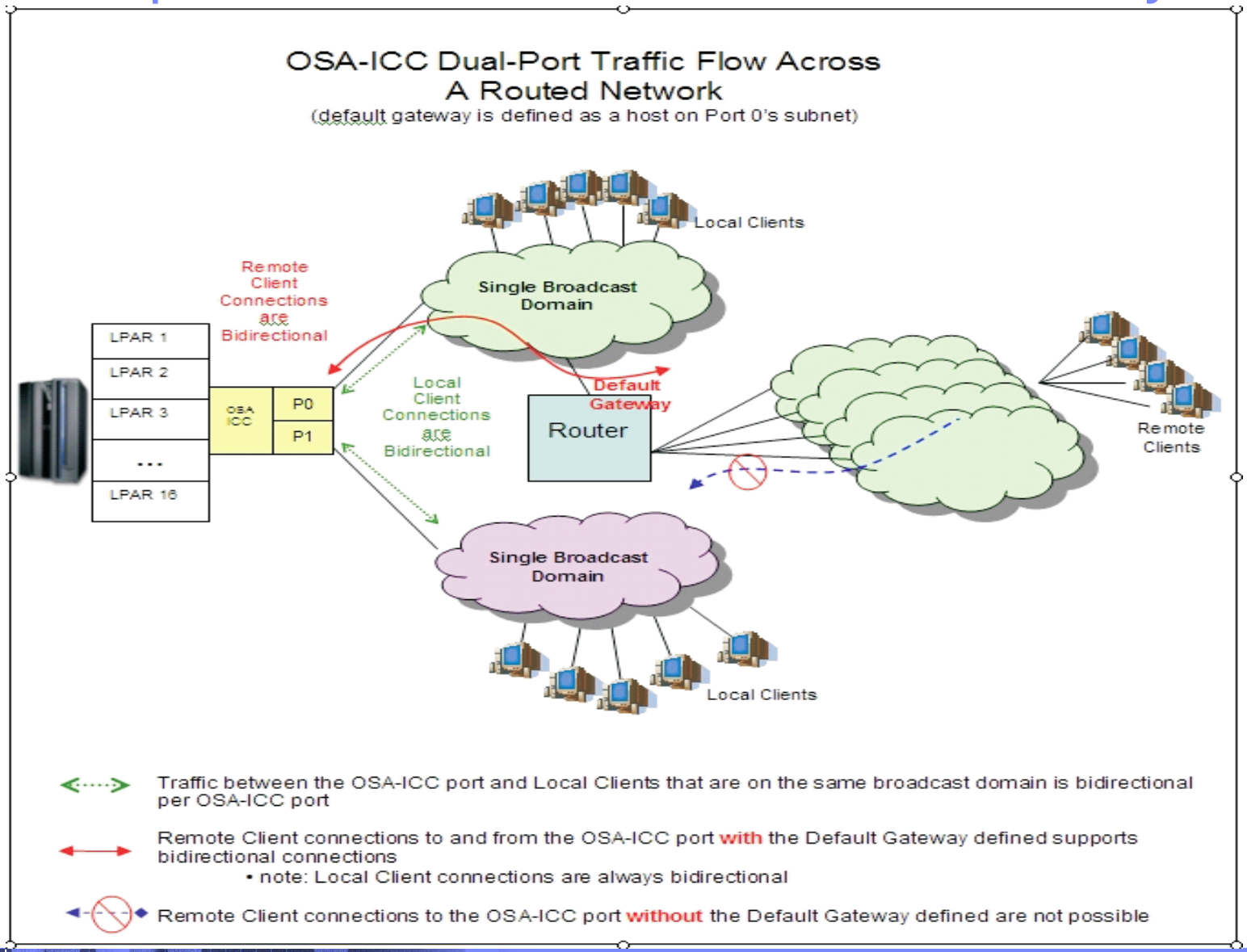
OSA-Express3/4S - Dual Port Connectivity

- **FC0417 – zEC12, zBC12**
  - OSA-Express5S 1000Base-T – One CHPID per FC / card
    - The CHPID has two ports (0,1)
    - OSC can use both ports (0,1)
- **FC0408 – zEC12, zBC12**
  - OSA-Express4S 1000Base-T – One CHPID per FC / card
    - The CHPID has two ports (0,1)
    - OSC can use both ports (0,1)
- **FC3367 - z10 EC, z10 BC, z196, z114 and zEC12**
  - OSA-Express3 1000Base-T – Two CHPIDs per FC / card
    - Each CHPID has two ports (0,1)
    - Each CHPID can be assigned as either OSC, OSD, OSE or OSN
    - OSC, OSD, OSE or OSN types can use both ports (0,1).
- **FC3369 - z10 BC and z114 only**
  - OSA-Express3 1000Base-T – One CHPID per FC / card
    - The CHPID has two ports (0,1)
    - OSC can use both ports (0,1)
- **Note:** Since there are two ports per CHPID, both of the ports associated with the CHPID must be the same OSA type, i.e. OSC, OSD, OSE or OSN
- **Note** : For OSD type CHPIDs - To use two-ports per CHPID, the following is required – z/OS V1.9+, z/VM V5.2+, z/VSE V4.1+, zTPF 1.1 PUT 4 with APARs. If this support isn't installed, only port zero in each CHPID can be used.

OSA-Express3/4S/5S – Dual Port Connectivity

- The OSA-Express3/4S/5S OSA-ICC Network on the next page shows connectivity with OSA-ICC dual-port support where each physical port (P0, P1) is configured on a different broadcast domain (LAN)
- Both P0 and P1 clients communicate with OSA through the defined TCP port
  - The remote clients are only allowed to connect through P0 since the default gateway is associated with this port
  - The local clients connected to P1 are restricted to communicate only with the clients of that subnet
- It is strongly recommended that production environments use redundant configurations where operator consoles are defined through two different OSA-ICC LANs on two different OSA cards to prevent the loss of console control in the unlikely event of a failure.

OSA-Express3/4S/5S – Dual Port Connectivity



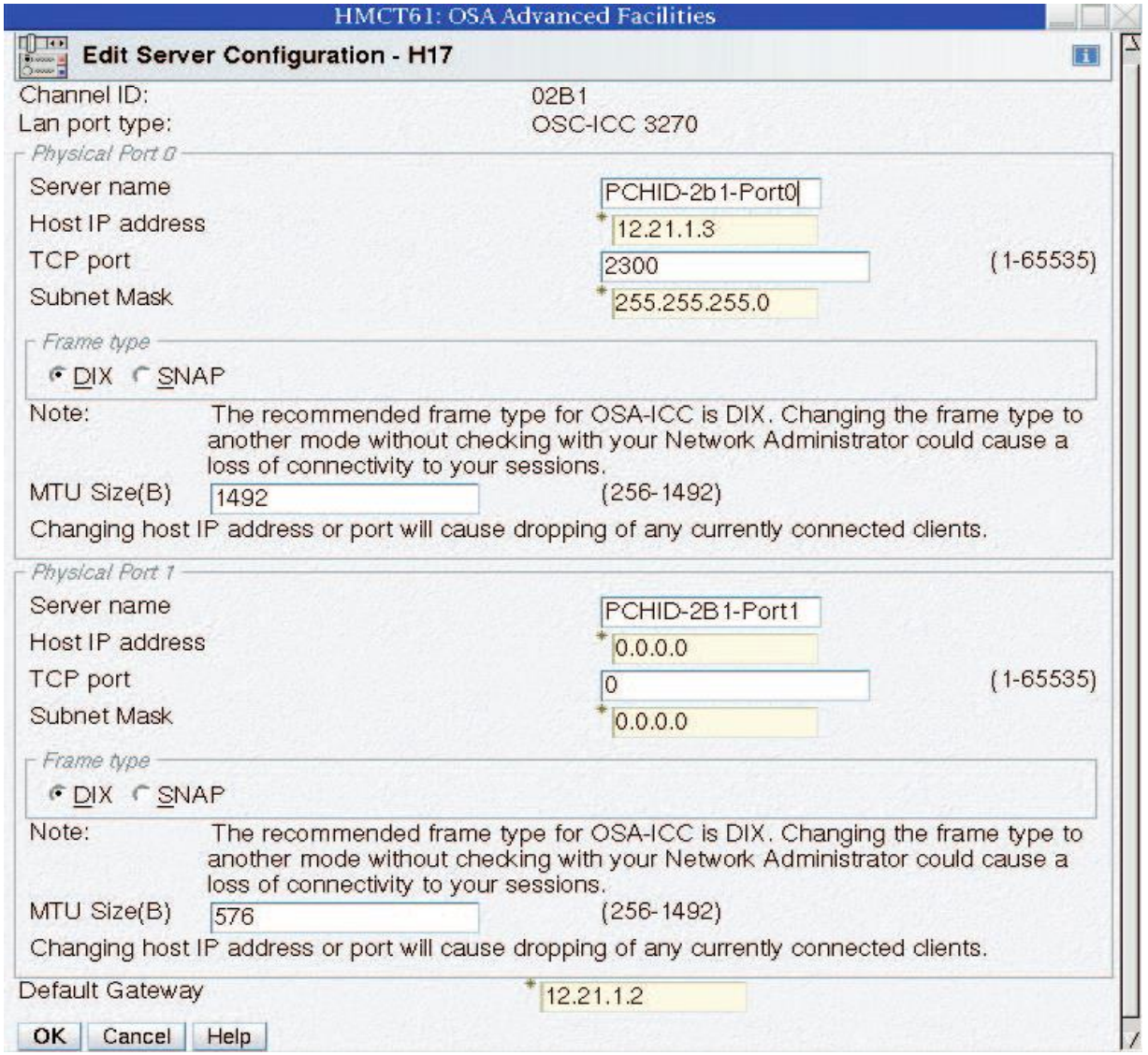
OSA-Express3/4S/5S - Dual Port Connectivity

- The following server definition rules apply when defining both physical ports:
  - There is a unique TCP Port number for each physical port
  - There is a different subnet for each physical port host IP
  - There is a single defined common gateway router with an interface on each IP Subnet. Only one of the ports defines the IP Default Gateway

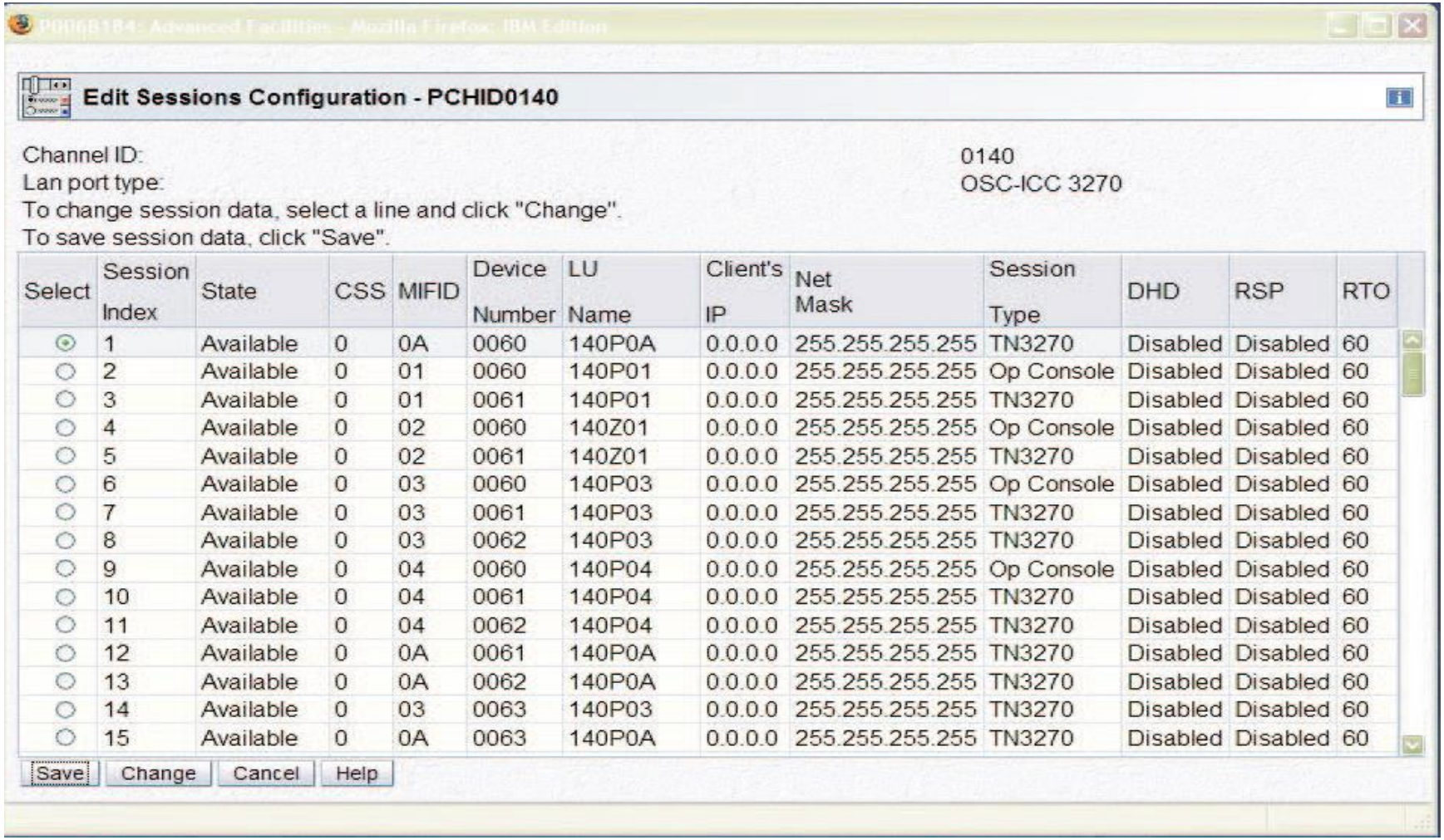
OSA-Express3/4S/5S – Adapter Port Setup Example - Edit Server Configuration

Port 0

Port 1



OSA-Express3/4S/5S – Adapter Port Setup Example - Edit Sessions Configuration



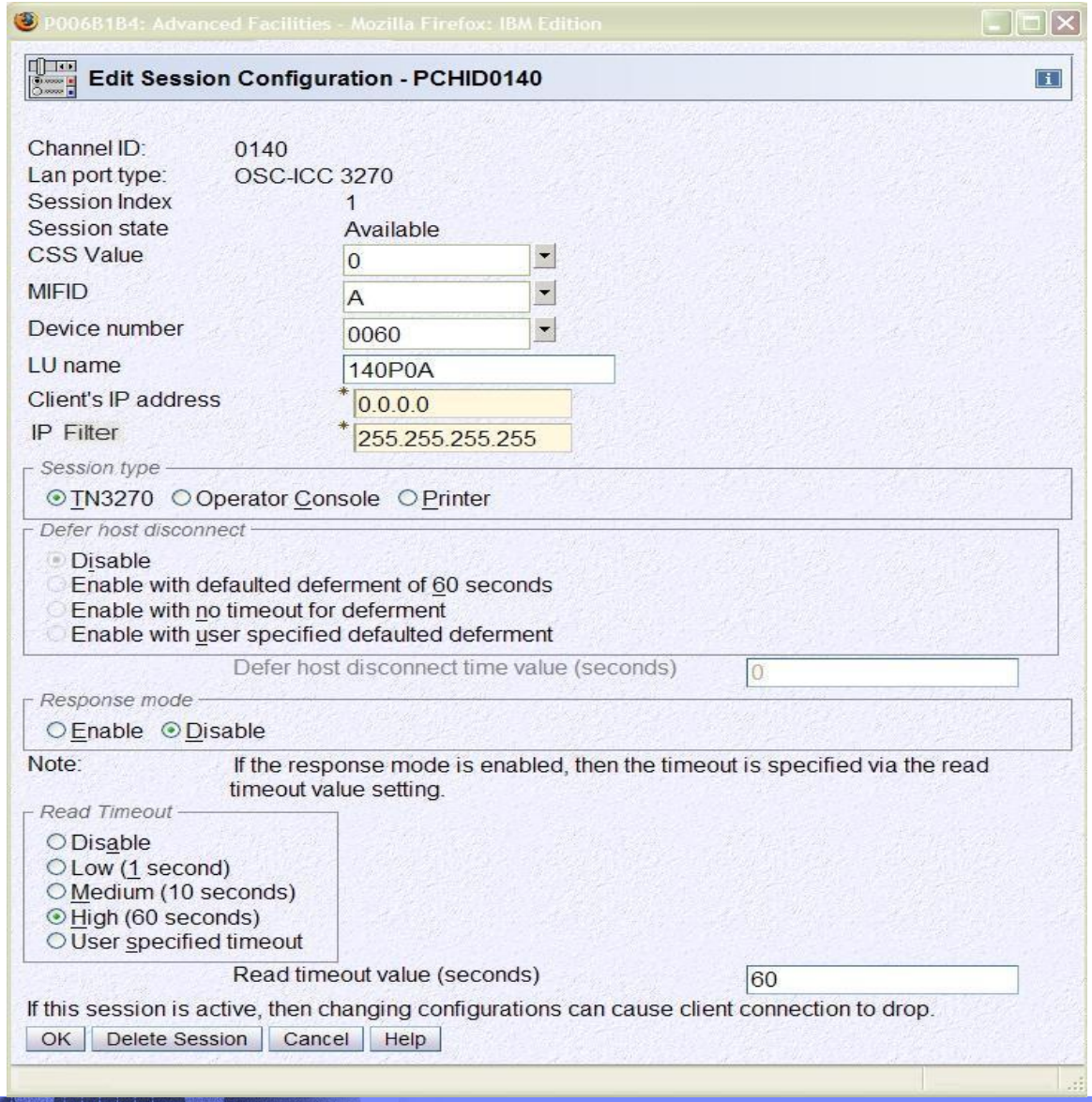
Edit Sessions Configuration - PCHID0140

Channel ID: 0140
Lan port type: OSC-ICC 3270
To change session data, select a line and click "Change".
To save session data, click "Save".

Select	Session Index	State	CSS	MIFID	Device Number	LU Name	Client's IP	Net Mask	Session Type	DHD	RSP	RTO
◉	1	Available	0	0A	0060	140P0A	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	2	Available	0	01	0060	140P01	0.0.0.0	255.255.255.255	Op Console	Disabled	Disabled	60
○	3	Available	0	01	0061	140P01	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	4	Available	0	02	0060	140Z01	0.0.0.0	255.255.255.255	Op Console	Disabled	Disabled	60
○	5	Available	0	02	0061	140Z01	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	6	Available	0	03	0060	140P03	0.0.0.0	255.255.255.255	Op Console	Disabled	Disabled	60
○	7	Available	0	03	0061	140P03	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	8	Available	0	03	0062	140P03	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	9	Available	0	04	0060	140P04	0.0.0.0	255.255.255.255	Op Console	Disabled	Disabled	60
○	10	Available	0	04	0061	140P04	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	11	Available	0	04	0062	140P04	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	12	Available	0	0A	0061	140P0A	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	13	Available	0	0A	0062	140P0A	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	14	Available	0	03	0063	140P03	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60
○	15	Available	0	0A	0063	140P0A	0.0.0.0	255.255.255.255	TN3270	Disabled	Disabled	60

Save | Change | Cancel | Help

OSA-Express3/4S/5S – Adapter Port Setup Example - Edit Session Configuration



OSA-Express3/4S/5S – Adapter Port Setup Example – Display Client Connections

HMCT61: OSA Advanced Facilities

Display Client Connections - H17

Channel ID: 02B1

Lan port type: OSC-ICC 3270

Session Index	Status	Physical Port Number	MAC	Clients IP	TCP Port	Socket Number	LT Index	Connect Rule	Disable Logo
1	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	0	Unknown	No
2	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	1	Unknown	No
3	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	2	Unknown	No
4	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	3	Unknown	No
5	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	4	Unknown	No
6	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	5	Unknown	No
7	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	6	Unknown	No
8	Available	0	00:00:00:00:00:00	0.0.0.0	0	0	7	Unknown	No

OK Help

OSA-Express3/4S/5S – Adapter Port Setup Example – Display Client Connections

Session Index - Specifies the session number. The valid range is from 1–120.

Status - Specifies whether the session is not configured, available, connected, active, or definition error:

Physical Port Identifier - Displays the server port (0 or 1) the client is connected to.

MAC - Specifies the address of the client that is being connected if the client is on the local end. Otherwise, the MAC address of the router is displayed.

Client's IP - Specifies the IP address of the attached client.

TCP Port - Specifies the port number of server which the client will connect through

Socket Numbers - This parameter is only useful to the OSA-ICC PE.

LT Index - This parameter is only useful to the OSA-ICC PE.

Connect rule - Can be IP only, LU only, IP & LU, unknown. For more information on connection rules, see Chapter 2, “Dual-port connection rules,” SA23-2266-01

LOGO - When enabled, the three line logo appears on client session, if disabled this three line logo will not appear.

Additional Information - Import / Export Configuration Definitions

- Recommend backing up OSA ICC Definitions
  - Under Advanced Facilities for each OSC CHPID
    - Manual Configurations Options
      - > Import / Export Source File
      - > Import / Export Source File by FTP
  - For example – Retain TIP H192934 -
    - LOSS OF CUSTOMER DEFINED OAT & ICC CONFIGURATION FILES
    - When the D0 IOCDS is used, ALL OSA Express cards PCHIDs are put into OSD mode.

Additional Information - Default MTU Size now 1492 Bytes

Retain TIP Record number: H196194

BEGINNING WITH DRIVER 79F, OSA EXPRESS3 ICC CHPIDS WILL SET THE DEFAULT MTU SIZE TO 1492 BYTES.

- In prior drivers and on other versions of the OSA/ICC cards, the MTU size defaulted to 576 bytes, but the operations guide strongly recommended setting this value to it's maximum of 1492 bytes for performance reasons.
- In DR79F, this change was made because in todays network environment, it makes no sense to set this value to less than 1492 bytes. With the introduction of the multiple ports per CHPID and a new Users Guide for multiple port support, we decided to make the change to the default value.
- The default MTU value change will ONLY take effect if a new configuration file is built, and no MTU size is specified by the customer.
- In the event of a mismatch caused by the new default value, the OSA card will take a few extra cycles to step down to the lower MTU size. This could result in a very slight degradation of network performance.
- If a MTU value less than 1492 is needed, it should be specified in the OSA/ICC configuration. See the User's Guide for the format of this configuration statement.

Additional Information - D/T3215 Support

- **SA23-2247-00 : OSA-ICC 3215 Support**
  - http://publibfp.boulder.ibm.com/epubs/pdf/ioa2sp00.pdf
- **HCD exception :**
  - **Problem:**

    TPF uses D/T3215 consoles. OSC channels support only D/T3270-X devices.
  - **Solution:**
    - HCD allows the definition of D/T3215 devices or D/T3270-X devices to an OSC channel and OSC control unit. A mix of both device types is not accepted.
    - **Error message:** CBDG490I OSC control unit @1 can not be defined to both device types D/T3215 and D/T3270-X
    - When generating an OSC CHPID statement in the IOCP deck, the attachment of D/T3215 devices are indicated by CHPARM=40.
    - The attachment of a D/T3215 device to an OSC control unit is controlled by VM UIM CBDUS314. The definition of a D/T3215 device to the VM operating system configuration is defined in VM UIM CBDUS260.

Implementation Services

- **IBM Announcement Letter ENUS609-021 - IBM Implementation Services for System z - IT process automation**
- http://www.ibm.com/legal/us/en/
- IT process automation is designed to assist you in automating your current System z IT processes to help enhance operational efficiency, improve performance, and reduce the total cost of ownership for your System z environment.
- **Module 2 - OSA-ICC implementation** - Assists you with the implementation of the Open Systems Adapter - Integrated Console Controller, which provides systems support for multiple logical partitions. This service can eliminate the need for external console controllers, enabling you to potentially minimize power, cooling, cabling, and floor space expenses.

Additional Information - Comparisons to the 2074

	OSA-ICC	2074-003
z/OS	All	All
Linux	No	No
z/VM, VM/ESA	z/VM 4.4 w/ptfs, z/VM 5.1, z/VSE V3.1	All
VSE/ESA	VSE/ESA 2.7and later	All
TPF	TPF V4R1 or z/TPF V1R1	All
# Sessions	120 per CHPID (240)	48 per ESCON port (96)
Spanned Channel	Yes	No
User Connection	LAN	LAN
Multiple CECs	No	Yes with multiple ESCON or via switch/director
Remote Access	Yes	Yes
Remote Configuration	Yes via HMC	No
3270 device	Yes	Yes
ESCON to Host	No, OSA-Express	Yes
Ethernet to user	10/100/1000 bps	10/100/1000 bps
Token Ring to user	No	4/16 bps

References

- **SA22-7990 OSA-ICC User’s Guide**
- **SG24-6364 OSA-ICC Implementation Guide Redbook**
- **SC23-2266-01 OSA-Express3 ICC Dual-Port User’s Guide**
- **Input/Output Configuration Program User's Guide**
- **SA22-7935 - Open Systems Adapter-Express Customer's Guide and Reference**

Terminology

- APAR - Authorized Program Analysis Report
- CHPID - Channel Path Identifier
- ESCON - Enterprise Systems CONNection
- FENET - Fast Ethernet (100 bps)
- GbE - Gigabit Ethernet
- ICC - Integrated Console Controller
- IFL - Integrated Facility for Linux
- IOCP - Input Output Control Program
- IPL - Initial Program Load
- LAN - Local Area Network
- LCSS - Logical Channel SubSystem

Terminology

- LIC - Licensed Internal Code
- LICCC - Licensed Internal Code Configuration Code
- LPAR - Logically Partitioned mode
- MES - Miscellaneous Equipment Specification
- MIF ID - Multiple Image Facility Identifier
- MTU - Maximum Transmission Unit
- OAT - OSA Address Table
- OSA - Open Systems Adapter
- OSA-ICC - Open Systems Adapter – Integrated Console Controller
- OSA/SF - OSA/Support Facility
- PCHID - Physical Channel Identifier
- PR/SM - Processor Resource / Systems Manager

End of Presentation