Configuring APPC for OS/2 and DOS

APPC Market Enablement

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Agenda

- APPN Network Design/Planning/Setup
- Naming Conventions
- Sample Configurations
- Networking Services/DOS

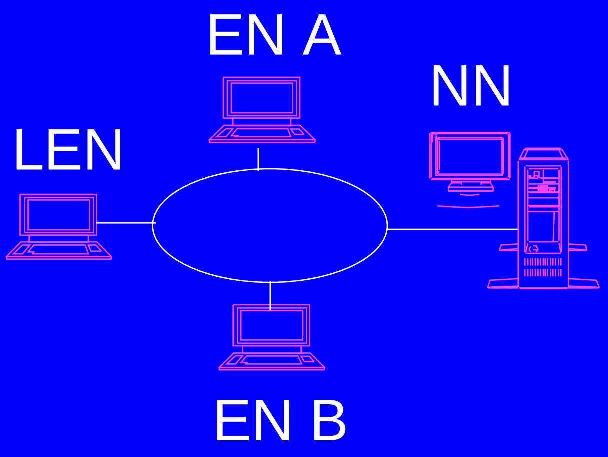
Level Set

- Assumes knowledge of APPC, CPI-C and APPN
- LAN examples
  - Extended Services
  - Networking Services/DOS
- Design principles are extendable to WANs

APPN Advantages

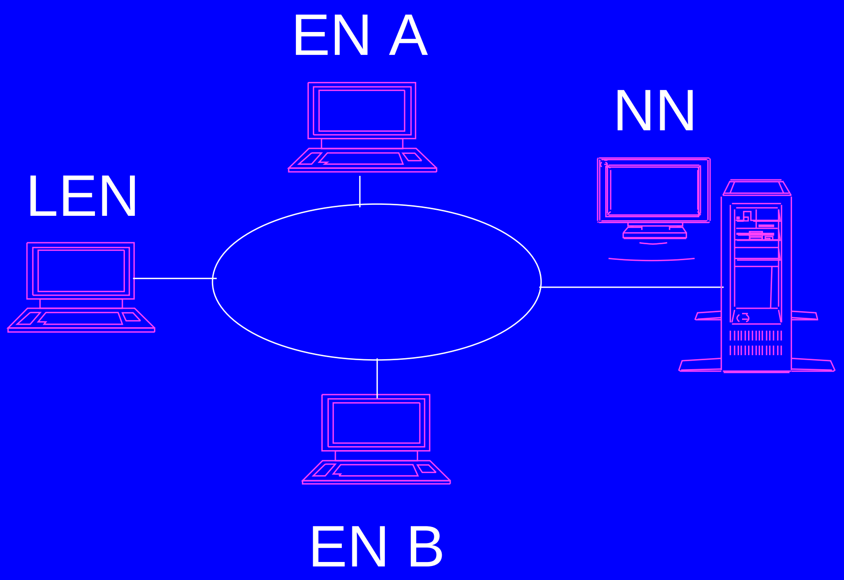
Configuration parameters by node type:

Network Node	End Node	LEN Node
LU Name	LU Name	LU Name
	NN Server	All Partners
		All Modes



Connection Network

- Allows nodes to communicate directly, without having sessions routed through a Network Node
- Use one Connection Network per logical LAN
- LENs can not participate



Network Design

- Design decisions are the same for large and small networks
- Use network design tools
  - Intrepid
  - Logical LAN Design (LLD)
- Use a Connection Network to reduce Network Node load

Network Node Design

- Each Network Node
  - Should have logical links to two other Network Nodes to ensure availability
  - For LANs, use locally administered addresses to avoid reconfiguration
  - OS/2 can support 128 links per adapter

Network Node Design (cont.)

- Memory Guidelines (ES)
  - APPC/APPN Overhead = 1.8 MB
  - Session Overhead = .007 MB / Session
  - End Node Support Overhead = .03 MB / End Node
  - Example: 32 ENs with 2 sessions each

    1.8 MB + 32 * (.03 + 2 *(.007)) MB = 3.2MB

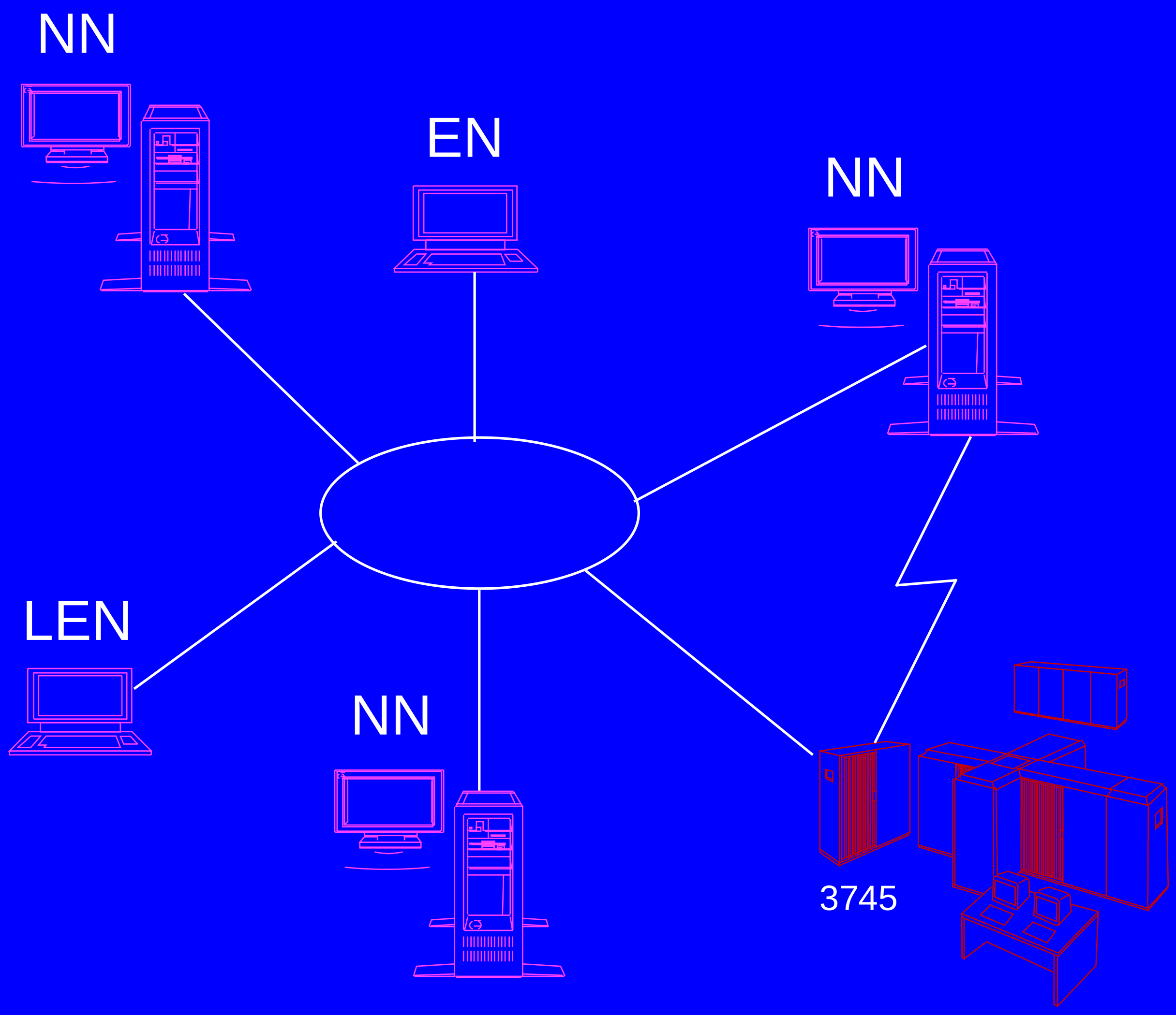
End Node Design

- Each End Node
  - Must know the address of its Network Node
  - May have a backup Network Node
- Memory Guidelines (ES)
  - APPC/APPN Overhead = 1.8 MB
  - Session Overhead = .007 MB / Session
  - Example: EN with 4 sessions
    - 1.8 MB + (4 * .007) MB = 1.83 MB

Naming Conventions

- Fully-qualified LU names are 8.8
- Use FQ LU names that are unique
- Register Network IDs
- Minimize the number of independent LUs per computer
- Use central administration
- Use something that is already unique

Partial Example Network



Network Node Configuration

```
/* Sample Node Definition File for Minimal Network Node             */

  DEFINE_LOCAL_CP                                /* Define this Node    */
    FQ_CP_NAME              (USIBMNR.NRR50AFD)   /* Control Point Name  */
    CP_ALIAS                (MYLU)               /* Same Everywhere     */
    NODE_TYPE               (NN);                /* Node Type           */

  DEFINE_CONNECTION_NETWORK                      /* Connection Network  */
    FQ_CP_NAME              (USIBMNR.CNNET01)    /* CN Name             */
    ADAPTER_INFO            (DLC_NAME (IBMTRNET) /* DLC Name            */
                             ADAPTER_NUMBER (0));/* Adapter Number      */

  DEFINE_LOGICAL_LINK                            /* Link to NN Neighbor */
    LINK_NAME               (NETNODE1)           /* Link Name           */
    DLC_NAME                (IBMTRNET)           /* DLC Name            */
    ADAPTER_NUMBER          (0)                  /* Adapter Number      */
    DESTINATION_ADDRESS     (X'60000C730000')    /* Address of partner  */
    ACTIVATE_AT_STARTUP     (YES)                /* Activate at Startup */
    CP_CP_SESSION_SUPPORT   (YES);               /* APPN Connection     */
```

Network Node Configuration

```
DEFINE_LOGICAL_LINK                                  /* Link to NN Neighbor */
    LINK_NAME              (NETNODE2)                  /* Link Name           */
    DLC_NAME               (IBMTRNET)                  /* DLC Name            */
    ADAPTER_NUMBER         (0)                         /* Adapter Number      */
    DESTINATION_ADDRESS    (X'60000C730200')           /* Address of partner  */
    ACTIVATE_AT_STARTUP    (YES)                       /* Activate at Startup */
    CP_CP_SESSION_SUPPORT  (YES);                      /* APPN Connection     */

  DEFINE_DEFAULTS                                      /* Define Defaults     */
    IMPLICIT_INBOUND_PLU_SUPPORT   (YES)               /* Avoid PLU config.   */
    DEFAULT_MODE_NAME              (#INTER)            /* Service Mode        */
    DIRECTORY_FOR_INBOUND_ATTACHES (*)                 /* Search the PATH     */
    DEFAULT_TP_PROGRAM_TYPE     (FULL_SCREEN)          /* Session Type        */
    DEFAULT_TP_OPERATION   (QUEUED_AM_STARTED);        /* TP Operation        */

  START_ATTACH_MANAGER;                                /* Start Attach Mgr.   */
```

EN Configuration

```
/* Sample Node Definition File for End Node                             */

  DEFINE_LOCAL_CP                                  /* Define this Node    */
    FQ_CP_NAME            (USIBMNR.NRR51AFD)       /* Control Point Name  */
    CP_ALIAS              (MYLU)                   /* Same Everywhere     */
    NODE_ID               (X'51AFD');              /* XID for 3270 Emul.  */

  DEFINE_CONNECTION_NETWORK                        /* Connection Network  */
    FQ_CN_NAME            (USIBMNR.CNNET01)        /* CN Name             */
    ADAPTER_INFO          (DLC_NAME (IBMTRNET)     /* DLC Name            */
                           ADAPTER_NUMBER (0));    /* Adapter Number      */

  DEFINE_LOGICAL_LINK                              /* Link to NN Server   */
    LINK_NAME             (SERVER  )               /* Link Name           */
    DLC_NAME              (IBMTRNET)               /* DLC Name            */
    ADAPTER_NUMBER        (0)                      /* Adapter Number      */
    DESTINATION_ADDRESS   (X'60000C730100')        /* Address of Partner  */
    ACTIVATE_AT_STARTUP   (YES)                    /* Activate at Startup */
    CP_CP_SESSION_SUPPORT (YES);                   /* APPN Connection     */
```

EN Configuration

```
  DEFINE_DEFAULTS                                     /* Define Defaults     */
    IMPLICIT_INBOUND_PLU_SUPPORT   (YES)              /* Avoid PLU config.   */
    DEFAULT_MODE_NAME              (#INTER)           /* Service Mode        */
    DEFAULT_TP_PROGRAM_TYPE   (FULL_SCREEN)           /* Session Type        */
    DEFAULT_TP_OPERATION (NONQUEUED_AM_STARTED); /* TP Operation        */

/* This CM provided TP allows remote Display of APPC configuration    */
  DEFINE_TP                                           /* TP Defintion        */
    TP_NAME  (RDSPSRVR)                               /* TP Name             */
    FILESPEC (C:\CMLIB\DSPSRVR\RDSPSRVR.EXE);         /* Filespec            */

  START_ATTACH_MANAGER;                               /* Start Attach Mgr.   */
```

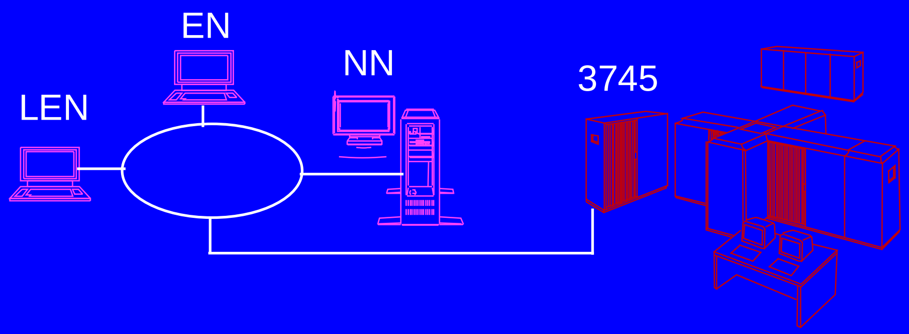
Wildcards

- Reduce the burden of defining LEN nodes to their Network Nodes
- Partial or Full
  - Specify LU mask
  - Only one Full wildcard allowed per APPN network (defined in only one NN)
- Useful for subarea network connections

Subarea Scenarios

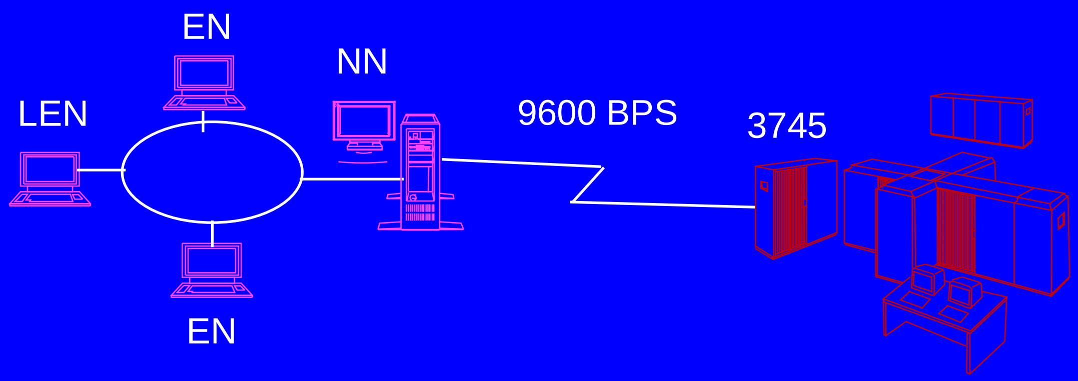
Local (LAN Attached) host:

Define Partial Wildcard at each End Node



Remote (Modem Attached) host:

Define Full Wildcard at Network Node



Wildcard into Subarea

```
/* NDF Fragments for the Subarea Adjacent NN, or for each EN          */

  DEFINE_LOGICAL_LINK                            /* Link to Subarea     */
    LINK_NAME                (SUBAREA)           /* Link Name           */
    FQ_ADJACENT_CP_NAME      (USIBMNR.SANODE)    /* Can be Anything     */
    ADJACENT_NODE_TYPE       (LEN)               /* LEN Connection      */
    DLC_NAME                 (IBMTRNET)          /* DLC Name            */
    ADAPTER_NUMBER           (0)                 /* Adapter Number      */
    DESTINATION_ADDRESS      (X'411111111111')   /* Use 3270 GW Addr.   */
    ACTIVATE_AT_STARTUP      (NO)                /* Do Not Autoactivate */
    CP_CP_SESSION_SUPPORT    (NO)                /* Not APPN Connection */
    LIMITED_RESOURCE         (NO);               /* Leave Sessions Up   */

  DEFINE_PARTNER_LU_LOCATION                     /* Subarea Wildcard    */
    FQ_PARTNER_LU_NAME       (USIBMNR.SA)        /* Wildcard Mask       */
    WILDCARD_ENTRY           (PARTIAL)           /* Partial Wildcard    */
    FQ_OWNING_CP_NAME        (USIBMNR.SANODE)    /* Route Allocates to: */
    LOCAL_NODE_NN_SERVER     (NO);               /* Need if we are a NN */
```

Defining a Backup Network Node

- **Problem: NN servers go down**
  - **Sessions to a NN triggered by link activation**
  - **To recover NN service, you must manually activate a link to a new network node (if one exists)**

Defining a Backup Network Node

- **Solution: Configure a backup NN**
  - **Requires a LEN connection and a wildcard definition to the backup NN**
  - **With no user intervention, you retain the ability to route data into the network**
  - **Limited ability to be found by the network: connection is now LEN**
    - **Connection Networks are now ignored**
    - **Sessions are now always routed through the backup NN**

Backup Network Node

```
/* NDF Fragments for each EN that needs a Backup NN                     */

  DEFINE_LOGICAL_LINK                                 /* Link to Backup NN   */
    LINK_NAME              (BACKUP)                   /* Link Name           */
    FQ_ADJACENT_CP_NAME    (USIBMNR.NRR416B3)         /* FQ Name of Backup NN*/
    ADJACENT_NODE_TYPE     (LEN)                      /* LEN Connection      */
    DLC_NAME               (IBMTRNET)                 /* DLC Name            */
    ADAPTER_NUMBER         (0)                        /* Adapter Number      */
    DESTINATION_ADDRESS    (X'60000C730000')          /* Address of Backup NN*/
    ACTIVATE_AT_STARTUP    (NO)                       /* Do Not Autoactivate */
    CP_CP_SESSION_SUPPORT  (NO)                       /* Not APPN Connection */
    LIMITED_RESOURCE       (NO);                      /* Leave Sessions Up   */

  DEFINE_PARTNER_LU_LOCATION                          /* Backup NN Wildcard  */
    FQ_PARTNER_LU_NAME     (USIBMNR.)                 /* Wildcard Mask       */
    WILDCARD_ENTRY         (PARTIAL)                  /* Partial Wildcard    */
    FQ_OWNING_CP_NAME      (USIBMNR.NRR416B3)         /* Route Allocates to: */
    LOCAL_NODE_NN_SERVER   (NO);                      /* Need if we are a NN */
```

APPNV.CTL

- **For Extended Services and CM/2**
- **Use configuration panels unless you need to edit the .NDF file**
- **For each configuration verb:**
  - **Syntax: parameters and valid values**
  - **Usage Notes**
  - **Defaults for optional parameters**
  - **Dynamic update capability**
  - **Example usage**
- **Use as a NDF reference**

Networking Services/DOS

- **Derived from AS/400 PC Support**
- **Provides the CPI-C programming interface**
  - **DOS and Windows**
  - **Family-API programs can run in DOS or OS/2**
- **Low-Entry Networking (LEN) Node**
- **Secondary link station only**
- **Sets up easily with small ASCII files**

NS/DOS Configuration

- **Required node definition (CONFIG.NSD):**

```
// Sample network configuration file for token-ring
//
NSDC LAN                            // Adapter type
NSDN USIBMNR.NRR53ABC               // Local LU name; 3-17 characters
TRLD SERVER,60000C730100            // Link to NN Server
```

- **Transaction Program definition:**
  DEFINETP.NSD
- **CPI-C Side Information: SIDEINFO.NSD**
- **Mode Definitions: MODE.NSD**

Summary

- **Remember APPC configuration tips**
  - **Use APPN to reduce APPC configuration**
  - **Use fewest possible Network Nodes**
  - **Use connection networks on LANs**
  - **Follow naming conventions**
  - **Use wildcards to attach to the Subarea**