Enterprise Networking Solutions

5724-I34
IBM Communications Server for Linux on zSeries;
SOD for NCP Subset on LINUX

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Topics

SNA/IP Integration

Introduction to the
Communications Server for Linux
on zSeries

Summary, reference, and contact
information

IBM Statement of Direction Update on SNA support in 2004

IBM's plans to support SNA workloads have not changed since the Statement of Direction made in 2002. As of June 2004, customers can—for selected SNA workloads—use Communications Server products for Linux®, Linux on IBM eServer® zSeries®, Microsoft® Windows®, and AIX® to replace some of the old SNA infrastructure components, such as the IBM 3745/46 or other channel-attached SNA controllers. z/OS® Communications Server can replace some (SNA Network Interconnect) SNI workloads using Enterprise Extender and Extended Border Node functions.

It is IBM's intent to introduce an additional solution in 2005 that uses NCP software running within Linux on zSeries. The intent is to provide a migration path for customers who use traditional SNA (including SNA Network Interconnect (SNI)) to communicate with their Business Partners. This solution can allow them to continue using traditional SNA without a dependency on IBM 3745 and 3746 Communications Controller hardware.

More information on IBM's Official Statement of Direction on SNA support on z/OS Communications Server is available at ibm.com/software/network/commserver/os390/

Communications Server for Linux on zSeries

SNA/IP Integration

IBM.

SNA/IP integration strategy objectives

✓ **Preserve investment in the SNA application portfolio for the "natural" lifetime of those SNA applications.**
  ➤ Preserve the ability to access those SNA applications using traditional end-user technologies such as an IBM 3270 terminal interface or SNA-based client/server program-to-program communication.
  ➤ Enable re-use of those same SNA applications from an emerging e-Business environment through various forms of Web-enabling technologies.
    ● User interface transformation through technologies such as Host Access Transformation Services.
    ● e-Business application integration through various forms of WebSphere Application Server connector technologies.

✓ **Reduce cost of owning and operating an enterprise networking infrastructure.**
  ➤ Remove business dependency on SNA networking technology that is no longer strategic or is nearing end of life.
    ● IBM 3745/46 Communication Controller (no longer marketed by IBM)
    ● Token-ring technology (products rapidly being withdrawn in general)
    ● ESCON channel-attached SNA controllers of various types (ESCON channel chips no longer manufactured)
    ● AnyNet technology (z/OS V1R7 is last z/OS release to support AnyNet on z/OS)
    ● OS/2 (End of Service announced for 2006)
  ➤ Reduce software licenses and maintenance costs associated with SNA wide area networking software and related management software.
  ➤ Reduce dependency on SNA wide area network technology skills.
  ➤ Be able to move forward with SNA to IP migration without dependency on business partner progress or lack thereof with respect to SNA to IP migration activities.

✓ **Improve return on investments in the enterprise networking infrastructure by consolidating all wide area network traffic into an IP-based networking technology.**
  ➤ Focus on establishing a highly available, scalable, and secure IP-based networking infrastructure.
  ➤ Reduce overall networking infrastructure complexity.
  ➤ Consolidate the SNA networking environment into the zSeries box(es) or as a minimum into the data center.
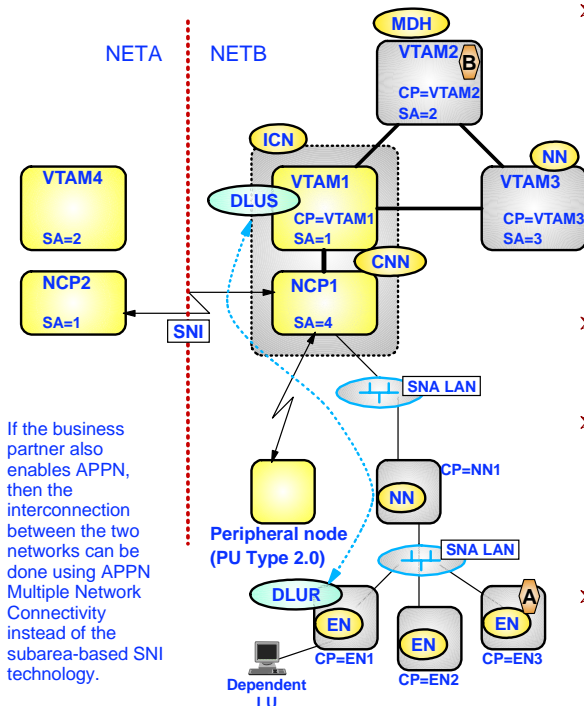
SNA Tutorial
SNA subarea networking
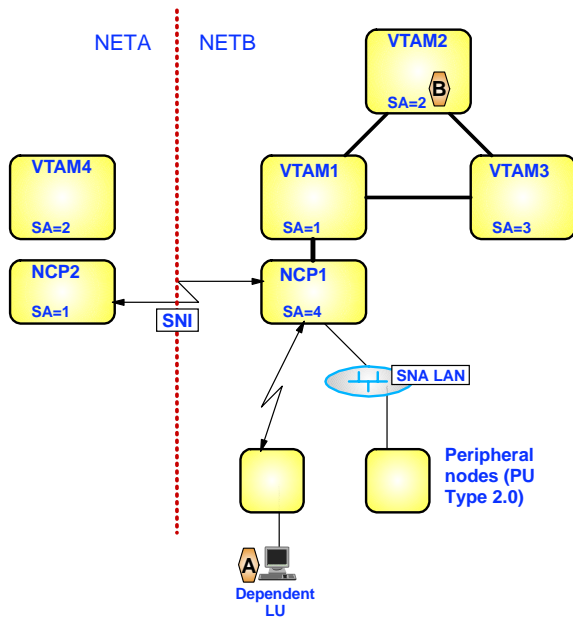
- Nodes are either subarea nodes (VTAM, NCP), or peripheral nodes.

- All resources (nodes, links, paths, applications, etc.) in an SNA network (a NETID) must be predefined on each subarea node for it to be able to establish sessions through the SNA subarea network:
  - For application B on SA=2 to establish sessions with an SNA Logical Unit A that belongs to an SNA peripheral node attached to the NCP in SA=4, the network topology between SA=2 and SA=4 must be defined on SA=2 and the LU name A must be defined as owned by VTAM1.

- If a resource on another node is not defined on this node, sessions cannot be established with it.

- Worked fine for a static, hierarchical network environment.

- If A and B are in session with each other over the link between SA=1 and SA=2 and that link fails, the SNA session between A and B will break.

- Different SNA subarea networks can be interconnected using SNA Network Interconnection (SNI) functions.

SNA Tutorial
SNA Advanced Peer to Peer Networking (APPN)

- SNA subarea and APPN networking may interact and some nodes may be both APPN node types and subarea node types.
  - NN: Network Node
  - EN: End Node
  - ICN: InterChange Node (can control session setup between the SNA subarea network and the APPN network)
  - EBN: Extended Border Node (controls session setup between two APPN networks)
  - CNN: Composite Network Node (An APPN NN that is comprised of a VTAM and one or more NCPs)
  - MDH: Migration Data Host (An EN that is also a subarea node)

- Non-subarea adjacent dependent LU access through an APPN network uses Dependent LU Requester/Server technology (DLUR/DLUS)

- Resources are discovered dynamically in an APPN network and need not be predefined.
  - When Application A on EN1 wants to talk to Application B on VTAM2, directory information locally and on NN1 will be searched - if not found, a search will flow to the other NNs in the APPN network and the location of and how to reach B will be identified and returned to EN1.

- If A and B are in session with each other over the link between VTAM2 and VTAM1 and that link fails, the SNA session between A and B will still break.
  - A new session can then be established between A and B by going via VTAM3 (as long as VTAM3 is an NN)
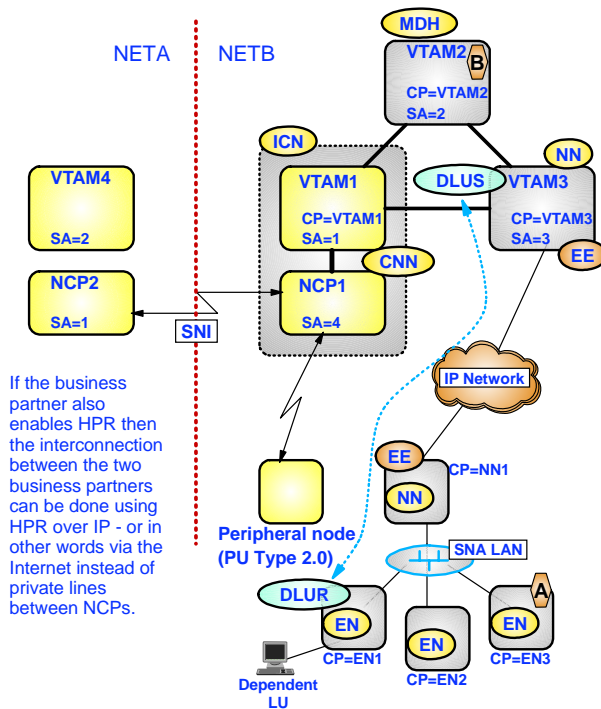
If the business partner also enables APPN, then the interconnection between the two networks can be done using APPN Multiple Network Connectivity instead of the subarea-based SNI technology.

SNA Tutorial
SNA High Performance Routing (HPR)

NETA NETB

MDH
VTAM2 **B**
CP=VTAM2
SA=2

ICN
VTAM1
CP=VTAM1
SA=1
CNN

DLUS VTAM3
CP=VTAM3
SA=3
EE

NN

VTAM4
SA=2

NCP2
SA=1
SNI

NCP1
SA=4

If the business partner also enables HPR then the interconnection between the two business partners can be done using HPR over IP - or in other words via the Internet instead of private lines between NCPs.

IP Network

EE CP=NN1
NN

Peripheral node
(PU Type 2.0)

SNA LAN

DLUR

EN CP=EN1
EN CP=EN2
EN CP=EN3 **A**

Dependent LU

➤ HPR is an extension to APPN, so an HPR environment inherits all the characteristics of APPN.

➤ If A and B are in session with each other over the link between VTAM2 and VTAM3 and that link fails, the SNA session between A and B will no longer break as long as the links between VTAM2, VTAM1, and VTAM3 are HPR links, such as XCF or MPC+ channels.
  ▸ When the link breaks, HPR will make a non-disruptive path switch and switch the session to go between VTAM2, via VTAM1, to VTAM3 and then further on via NN1 to EN3.

➤ An extension to HPR is to use an IP network as an HPR link - this is known as HPR over IP (HPR/IP) or more generally as Enterprise Extender (EE)
  ▸ HPR looks at the entire IP network - iregardless of the size of that IP network as a single HPR link
  ▸ If topology in the IP network changes, it is up to the IP infrastructure to recover from that change and reroute IP packets via alternate routes
  ▸ With EE enabled on z/OS, SNA traffic leaves and enters z/OS as IP packets, which means SNA/HPR/EE traffic can benefit from OSA-Express QDIO high capacity network adapters such as Gigabit Ethernet.

SNA/IP integration elements

A multi-step approach:

1. Consolidate intranet **SNA 3270** traffic (LU1/SCS, LU2, LU3/DSC) into the data center:
   – Using TN3270 client software (PCOM, HOD, OEM) on the user workstation connecting to a TN3270 server in the data center, which could be z/OS or Linux on zSeries
   – Using standard Web browser on the user workstation connecting to WebSphere Application Server Host Access Tranformation Services on a server node in the data center, which could be z/OS or Linux on zSeries

2. Move **middleware** communication off SNA where applicable. DB2 DRDA, MQ, etc. can be migrated to native IP communication without impact on database or messaging applications.

3. For remaining **SNA Client/Server applications** in the branches/remote locations (LU0, LU6.2), use one of the following technologies to transport the SNA data over an IP network:
   – Enterprise Extender to transport native SNA flows over an IP WAN network from the branch and into the data center. EE can be deployed in the branch on the workstation or on an EE gateway in the branch. In the data center, EE can be deployed on an EE gateway, such as CS Linux, or on z/OS itself.
   – Use a remote SNA API technology to ship SNA application calls over an IP network to an SNA API server running on CS Linux in the data center.

4. Move IBM 3745/46-based **business partner communication** to Enterprise Extender technology or to a future NCP support on Linux (SOD).
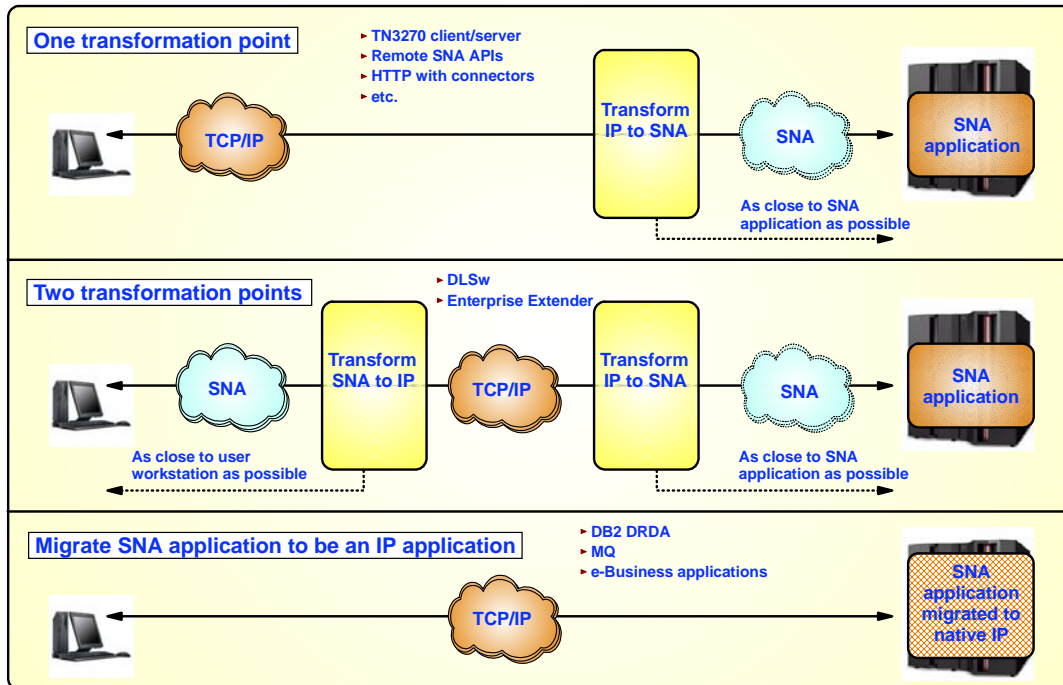
5. Migrate OS/2-based SNA branch server applications to Linux and use either the EE technology or the remote API technology to traverse the IP wide area network.

6. To the extent supported, move remaining native SNA communication coming in through an IBM 3745/46 to the future NCP support on Linux (SOD).

SNA/IP integration without changing SNA applications - a transformation is needed somewhere!

One transformation point

- ▸ TN3270 client/server
- ▸ Remote SNA APIs
- ▸ HTTP with connectors
- ▸ etc.

[diagram: workstation → TCP/IP → Transform IP to SNA → SNA → SNA application]

As close to SNA application as possible

Two transformation points

- ▸ DLSw
- ▸ Enterprise Extender

[diagram: workstation → SNA → Transform SNA to IP → TCP/IP → Transform IP to SNA → SNA → SNA application]

As close to user workstation as possible

As close to SNA application as possible

Migrate SNA application to be an IP application

- ▸ DB2 DRDA
- ▸ MQ
- ▸ e-Business applications

[diagram: workstation → TCP/IP → SNA application migrated to native IP]

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zSeries operating system SNA/IP integration transformation point capabilities

- ● **z/OS:**
  - ▸ Supports both TCP/IP and SNA applications
  - ▸ Has a built-in TN3270 server
  - ▸ Supports EE functions natively on z/OS including business partner connectivity over EE
  - ▸ Supports WebSphere Application Server based transformation points
  - ▸ Numerous subsystem-based built-in transformation capabilities (CICS Web Services, IMS Connect, etc.)

- ● **VSE/ESA:**
  - ▸ Supports both TCP/IP and SNA applications
  - ▸ Latest VSE/ESA version has a built-in TN3270 server

- ● **z/VM:**
  - ▸ Supports both TCP/IP and SNA applications
  - ▸ Has a built-in TN3270 server

- ● **TPF:**
  - ▸ Supports both TCP/IP and SNA applications

Collapse the SNA network into zSeries using existing mainframe OS capabilities - or Linux on zSeries as the SNA/IP integration transformation point.

[diagram: Linux — Transform IP to SNA → SNA → Mainframe OS environment — SNA application]
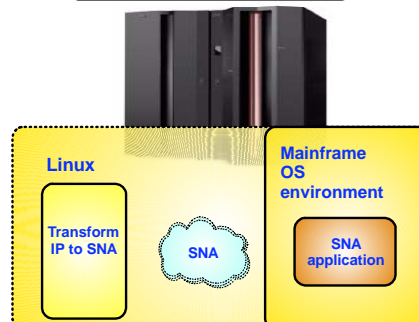
Preferred transformation point location:
1. Inside same OS image as SNA application
2. Inside same zSeries box as SNA application
3. Inside the z/OS Sysplex
4. Inside data center environment

The z/OS environment

Why place the transformation point on z/OS?

- ✓ Functions
  - ► Functionally most rich TN3270 server on the market
  - ► Supports both SNA subarea-based (SNI) and EE-based (EBN) business partner connectivity
- ✓ Performance
  - ► No extra "hops"
  - ► IP traffic over high-speed OSA-Express interfaces
  - ► High-performance same-OS interfaces between the IP and SNA side of the transformation point
- ✓ Capacity/Scalability/Availability
  - ► Both the SNA and TCP/IP environments on z/OS are based on and use the z/OS Sysplex technologies
  - ► A single TN3270 server can service up to 128,000 TN3270 clients
- ✓ Simplification
  - ► All functions are incorporated into one single operating system environment
  - ► The SNA network is collapsed to reside inside the z/OS Sysplex environment or the z/OS systems in the data center(s)
- ✓ Disaster recovery
  - ► Disaster recovery planning from a network connectivity point of view is significantly simplified if all network access to z/OS is based on TCP/IP - dynamic movement of IP addresses to move functions from one site to another site
- ✓ Security
  - ► IP to z/OS allows use of IP-based security functions that will secure network data all the way into z/OS
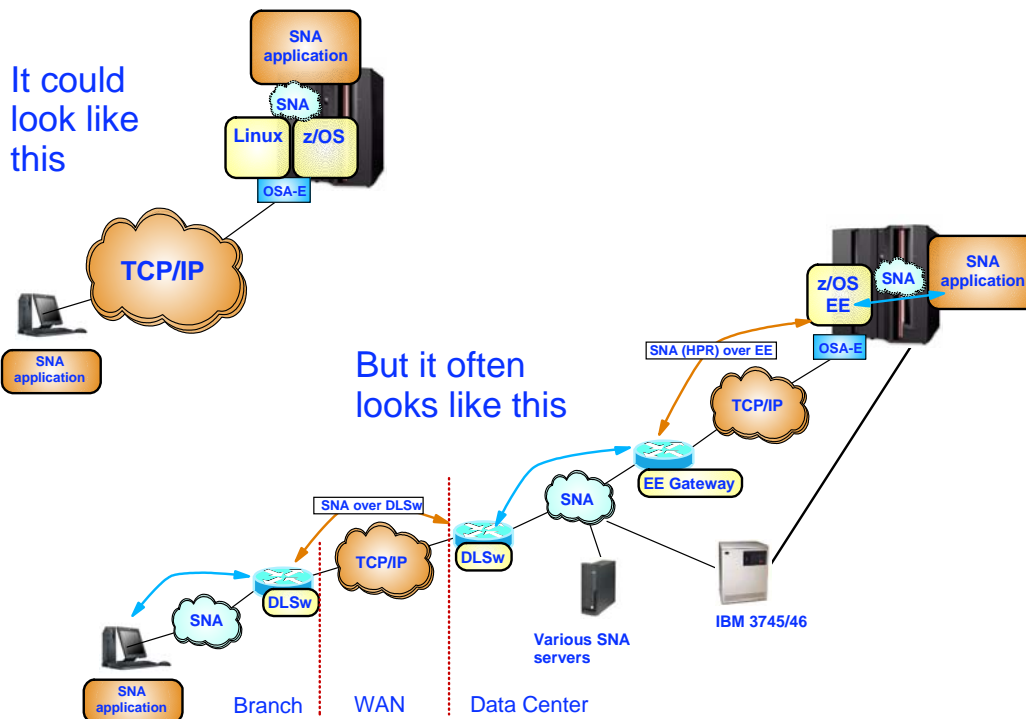
Why not place the transformation point on z/OS?

- ✗ Lack of z/OS SNA skills
  - ► EE requires z/OS to be APPN-enabled
  - ► TN3270 server on z/OS requires different z/OS SNA configuration definitions than non-z/OS resident TN3270 servers do
  - ► EE business partner connectivity requires APPN multiple network connectivity configuration (EBN and session management)
- ✗ Lack of z/OS TCP/IP skills
  - ► A transformation point on z/OS requires TCP/IP to be functional on z/OS
- ✗ Cost of z/OS MIPS (processor and software charges) versus IFL engines

If you have the choice, choose z/OS!

Potential for real infrastructure simplification

Communications Server for Linux on zSeries

Introduction to the Communications Server for Linux on zSeries

IBM.

Traditional SNA wide area networking infrastructure

Corporation A

Business partner

3745/46

NCP

SNI

3745/46

NCP

Token-ring

EP/BTAM devices

X.25 Network

APPN Network

TN3270 gateway

SNA Network

SNA Device

IP Network

SNA application gateway

SNA Device such as Frame Relay

TN3270 clients

IP or SNA Network

SNA application gateway clients

Communications Server for Linux on zSeries reduces the dependency on the IBM 3745/46

SNA

Linux on zSeries

LCS

LSA

CS Linux on zSeries
- ✓ TN3270 gateway
- ✓ Enterprise Extender gateway
- ✓ SNA application gateway
- ✓ Remote SNA API server

- ✓ z/OS
- ✓ VSE/ESA
- ✓ z/VM

Communications Server for Linux on zSeries can exchange SNA data with the other zSeries operating systems using:
- ▶ Enterprise Extender (z/OS only)
- ▶ A Channel-to-Channel (MPC protocols)
- ▶ A shared SNA LAN (Token-ring or Ethernet)

Business partner

3745/46

NCP

OSA-E

QDIO

Ethernet-based IP infrastructure

SNI**

3745/46

NCP

X.25 Network **

SNA Device

IP-based wide area Network

1 Enterprise Extender

APPN Network

SNA Network**

SNA Device such as Frame Relay

Not addressed by CS Linux. Selected** functions addressed by SOD about NCP support on Linux: "CCL".

IP Network

2

EP/BTAM devices

TN3270 clients

IP Network

3

SNA remote API clients

1. Enterprise Extender technology to transport SNA flows over an IP network to the Enterprise Extender same-NETID gateway functions of CS Linux on zSeries
2. Pull distributed TN3270 servers into CS Linux for zSeries - enabling IP communication all the way from the TN3270 clients to zSeries
3. Pull SNA gateway application into CS Linux for zSeries - enabling IP communication all the way from the SNA application gateway clients to zSeries

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IBM Communications Server for Linux on zSeries program product number 5724-I34

➤ **Advanced Peer-to-Peer Networking (APPN) support**
- ▶ APPN End Node (EN) or APPN Network Node (NN) support
- ▶ Uses Dependent LU Requester (DLUR) for dependent LU access over an APPN network

➤ **High Performance Routing (HPR) including Enterprise Extender (EE, a.k.a.. HPR over IP)**

➤ **Branch Extender (BX) support**
- ▶ Allows for APPN network topology simplification

➤ **SNA API support**
- ▶ CPI-C and APPC APIs for both dependent and independent LU6.2 - including extensions for both Java and C
- ▶ Java Host Access APIs
- ▶ LUA APIs (Request Unit Interface (RUI) and Session Level Interface (SLI)) for dependent LU functions (LU types 0, 1, 2, and 3)
- ▶ Remote SNA client/server APIs
- ▶ APPC application suite (AFTP, APING, AREXEC, ATELL, ACOPY, and ANAME)

➤ **TN3270E server**
- ▶ Including SSL with client authentication and Express Logon support
- ▶ Telnet redirector - allows Telnet port mapping and/or Telnet passthru from SSL to non-SSL

➤ **Administration**
- ▶ Motif-based administration (GUI interface)
- ▶ Network Operator Facility (NOF) APIs for programmed administration
- ▶ Internationalization
- ▶ 31-bit and 64-bit support
- ▶ Runs on both RedHat and SuSE

➤ **Network attachments for SNA**
- ▶ Enterprise Extender (HPR over IP)
- ▶ (V)CTC using MPC channel protocols (Linux as a PUT2.1)
- ▶ Native SNA over shared LAN (Ethernet or Token-Ring)

Available since May 2004

CS Linux is also offered in an Intel Linux version: 5724-I33

Consolidating existing distributed TN3270 Servers into Linux for zSeries
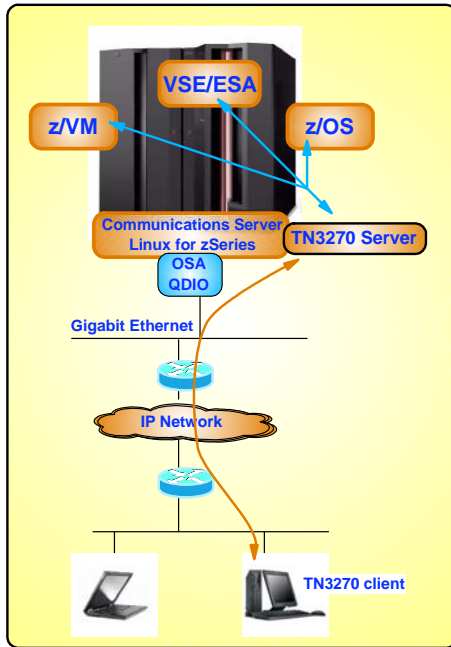
- ➤ Minimal or no changes to VTAM definitions of TN3270 server PUs and LUs
  - ▸ Continue to look like a PU type 2.1 (or 2.0) with dependent LUs of type 1, 2, and 3
  - ▸ USS table handling continues to be performed by the VTAM SSCP
  - ▸ Default application logon continues to be handled via existing VTAM definitions
- ➤ Configuration concepts for TN3270 servers remain similar to how they were for the distributed TN3270 servers
- ➤ Connectivity to zSeries via Gigabit Ethernet and QDIO
- ➤ SNA connectivity between Linux for zSeries and:
  - ▸ z/OS: EE (HiperSockets), CTC/MPC, or shared LAN
  - ▸ z/VM and VSE/ESA: CTC/MPC or shared LAN
- ➤ SNA collapsed into the data center
- ➤ In most configurations, the LU element addresses will come out of VTAM's high-order address pool
- ➤ Reduced dependency on IBM3745/46, CIP, or Token-ring hardware
- ➤ We do not recommend customers moving from the z/OS TN3270 to the CS Linux TN3270 server

Combining CS Linux on zSeries with Host On Demand
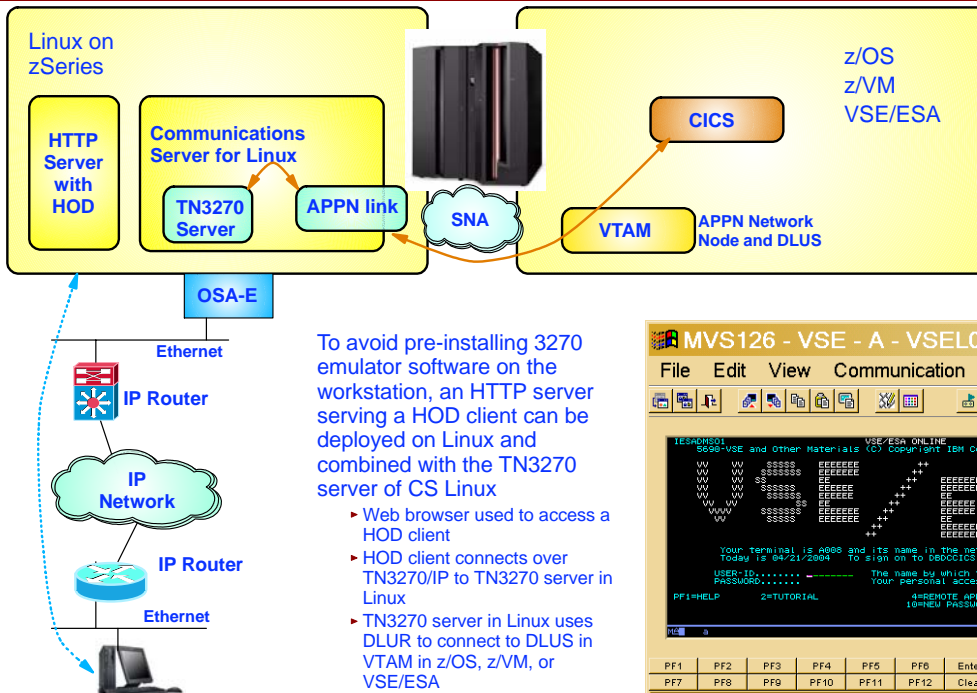
To avoid pre-installing 3270 emulator software on the workstation, an HTTP server serving a HOD client can be deployed on Linux and combined with the TN3270 server of CS Linux

- ▸ Web browser used to access a HOD client
- ▸ HOD client connects over TN3270/IP to TN3270 server in Linux
- ▸ TN3270 server in Linux uses DLUR to connect to DLUS in VTAM in z/OS, z/VM, or VSE/ESA
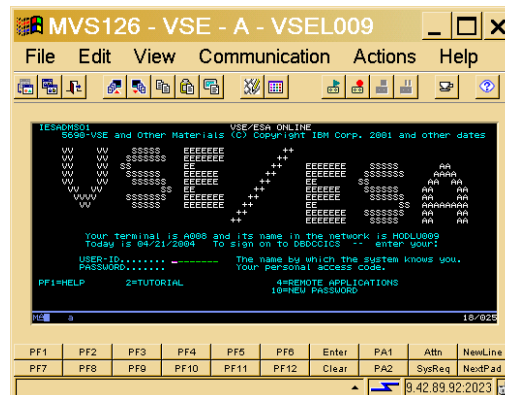
3270: one step further - CS for Linux on zSeries and IBM's Host Access Transformation Services

- ➤ Universal workstation client: Web browser
  - ▸ Basically all platforms with a Web browser are supported
- ➤ No 3270 emulator software (fat client or down-loaded) on workstation
- ➤ Only HTTP/HTTPS over IP between workstation and WebSphere Application Server
  - ▸ Simplifies firewall setup
- ➤ No changes to existing mainframe SNA 3270 applications
- ➤ User interface can remain 3270-like, or it can be transformed using the WebSphere Studio tooling

Network infrastructure simplification
- ▸ IP network access from end user to mainframe
- ▸ SNA network collapsed into zSeries

Scalability
- ▸ Vertical scaling through zSeries 64-bit storage support and powerful parallel CPU engines
- ▸ Horisontal scaling through z/VM technologies

Availability
- ▸ zSeries hardware availability
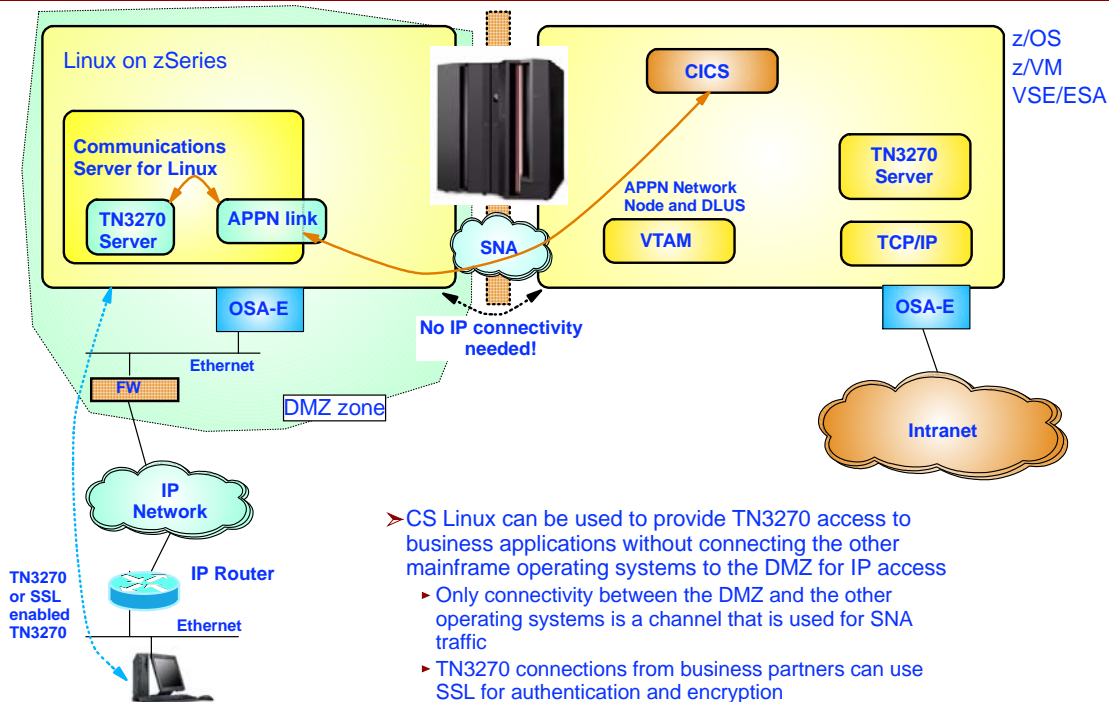- ▸ Multiple parallel virtual environments can be deployed

Security
- ▸ Security-rich internal network connectivity between Linux and the mainframe operating systems
- ▸ Encryption/decryption of HTTPS connections done with zSeries IFL engines and hardware crypto support
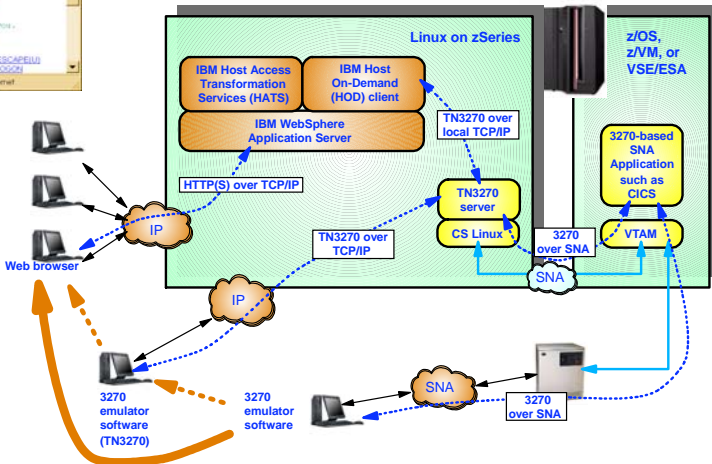
Secure business partner TN3270 access via CS Linux

- ➤ CS Linux can be used to provide TN3270 access to business applications without connecting the other mainframe operating systems to the DMZ for IP access
  - ▸ Only connectivity between the DMZ and the other operating systems is a channel that is used for SNA traffic
  - ▸ TN3270 connections from business partners can use SSL for authentication and encryption

VSE/ESA or z/VM and Enterprise Extender gateway on Linux on zSeries
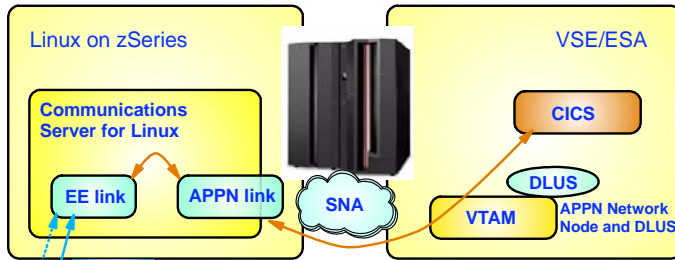
To use the CTC/MPC connectivity between Linux and VSE/ESA or z/VM, VSE/ESA or z/VM VTAM must be configured as an APPN Network Node

Workstation configuration options:
- ► SNA traffic to a local EE gateway, such as a Cisco SNA Switch router or an IBM Communications Server on the local LAN (IP flows from the local EE gateway upstream)
  - ● DLUR functions performed by EE gateway
- ► EE flows directly from the workstation using a product such as IBM's PCOM or IBM Communications Server for Windows (IP flows all the way to the workstation)
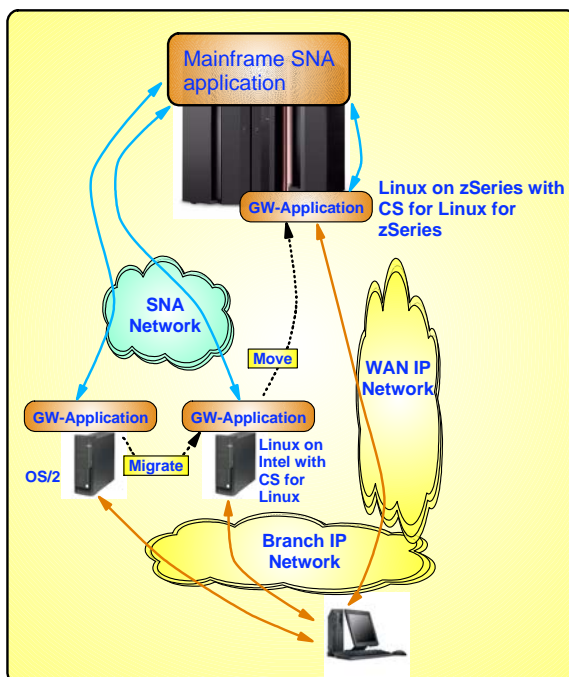 - ● DLUR functions performed by local workstation

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Customer-written SNA application gateway programs on OS/2

➤ Customers migrating off OS/2 can take advantage of the CS Linux SNA API capabilities

Example:

A customer-specific application that runs on OS/2 and acts as a gateway between users in a branch and SNA applications on the mainframe:
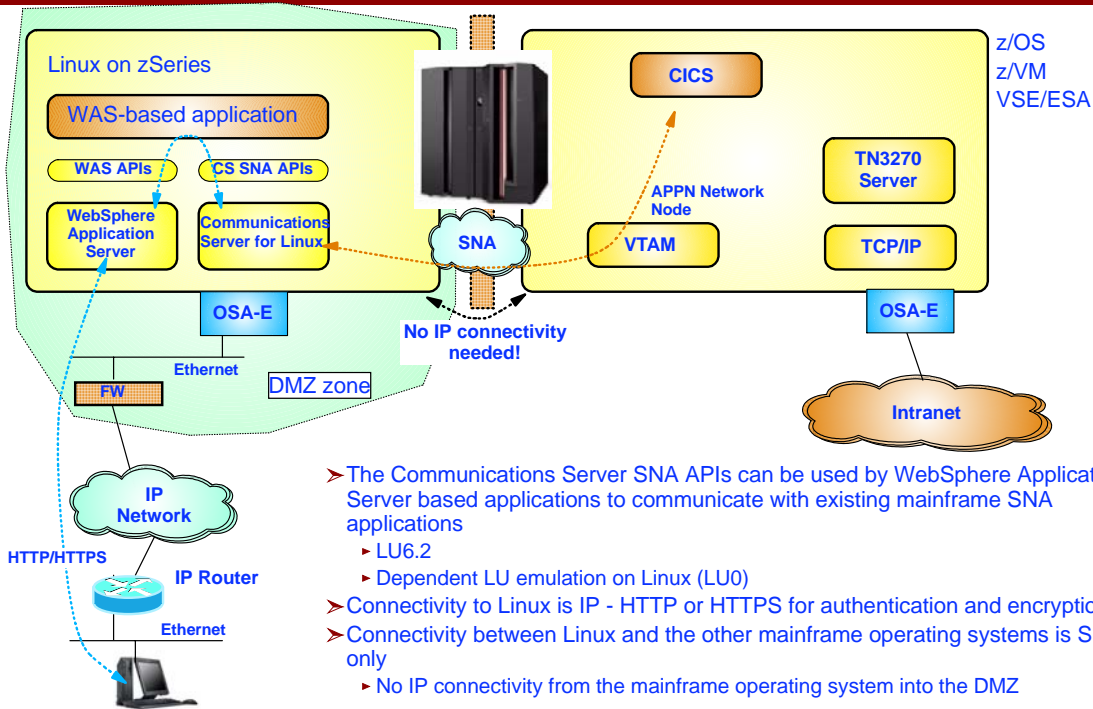- ► upstream: SNA LU0 or LU6.2
- ► downstream: TCP/IP

The first step is to rewrite the application to run on Linux instead of OS/2 - potentially deploying the gateway application initially on Linux for Intel in the branch. The SNA APIs provided by CS Linux are the same APIs as provided by CS OS/2.
- ► CS Linux provides multiple SNA programming interfaces, including:
  - ● CPI-C for LU6.2
  - ● APPC for LU6.2
  - ● LUA (for LU0, 1, 2, and 3)

If initially deploying on Linux for Intel, a second step is to consolidate the gateway application into Linux on zSeries, collapsing the SNA network segment to be within the zSeries environment.

Business partner Web access to mainframe SNA applications through the CS Linux SNA APIs

- Linux on zSeries
  - WAS-based application
  - WAS APIs
  - CS SNA APIs
  - WebSphere Application Server
  - Communications Server for Linux
  - OSA-E
  - Ethernet
  - FW
  - DMZ zone
- CICS
- TN3270 Server
- APPN Network Node
- VTAM
- TCP/IP
- SNA
- OSA-E
- z/OS
- z/VM
- VSE/ESA
- No IP connectivity needed!
- IP Network
- HTTP/HTTPS
- IP Router
- Ethernet
- Intranet
- Web browser access

➤ The Communications Server SNA APIs can be used by WebSphere Application Server based applications to communicate with existing mainframe SNA applications
  ► LU6.2
  ► Dependent LU emulation on Linux (LU0)
➤ Connectivity to Linux is IP - HTTP or HTTPS for authentication and encryption
➤ Connectivity between Linux and the other mainframe operating systems is SNA only
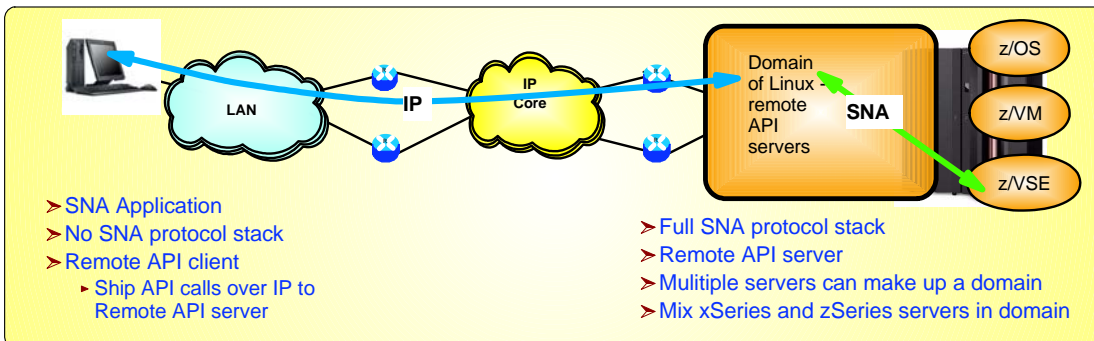 ► No IP connectivity from the mainframe operating system into the DMZ

Remote API Client/Server technology

➤ The remote SNA API support allows SNA application programs to reside on nodes that don't implement a full SNA protocol stack.
➤ The SNA API calls are intercepted by a shim layer that ships the calls over a TCP connection to a Remote API server where the actual SNA API calls are executed.
➤ This technology provides a solution for SNA application programs that must remain in remote locations - without requiring SNA protocol stacks on those remote nodes.
  ► Removing the need for SNA stack configuration skills, management, and operations procedures outside the data center where the remote SNA API servers may be collapsed
➤ This technology also provides built-in availability and load-balancing to a pool (domain) of Remote API servers
  ► A Remote API client is not limited to use a single Remote API server
  ► Pools of LUs can be shared across servers on a Domain.
  ► Servers can be configured to back up each other
➤ There is no charge for installing the Remote API client - usage is covered by per-user server charge
➤ Support Windows XP, 2000, 2003 Server clients and Linux clients

- LAN
- IP
- IP Core
- Domain of Linux - remote API servers
- SNA
- z/OS
- z/VM
- z/VSE

➤ SNA Application
➤ No SNA protocol stack
➤ Remote API client
  ► Ship API calls over IP to Remote API server

➤ Full SNA protocol stack
➤ Remote API server
➤ Mulitple servers can make up a domain
➤ Mix xSeries and zSeries servers in domain

Communications Server for Linux on zSeries

Summary

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Summary

➢ Customer interest in SNA functions on Linux in general is high

➢ Simplifying the network infrastructure may have a direct impact on TCO
  - Reduced SNA software licenses
  - Reduced network hardware costs
  - Reduced line costs (no parallel networks)
  - Reduced cost of SNA management software
  - Reduced operations cost
  - Reduced total WAN capacity
  - Reduced overall complexity (consolidating onto Linux)

➢ SNA skills are on the decline – the less dependency on SNA in the wide area network, the better
  - Consolidating SNA skills into the data center

➢ Worries among many customers about 374x hardware spare part availability
  - The faster a migration off 374x technology can be done, the better

➢ Many mainframe applications remain SNA-based
  - Customers want a set of solutions that can help address the network infrastructure challenges they have today with existing SNA networks that doesn't require them to change the mainframe applications in coordination with changes to the SNA network.

  ★ **All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.**

> **Solutions are available today and more will become available during 2004 and 2005! (*)**

Consolidating distributed TN3270 servers onto Linux for zSeries

Consolidate from:
- ▸ Channel- or Token-ring attached TN3270 servers
- ▸ Microsoft SNA Servers or Host Integration Servers
- ▸ Various OEM distributed TN3270 server solutions
  - – Apertus, OpenConnect, Attachmate, Novell, etc.
- ▸ CS AIX
- ▸ CS OS/2

TN3270

SNA   TCP/IP
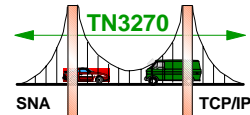
Easy, high-value transition

Benefits of consolidation onto Linux for zSeries:
- ▸ Replace heterogeneous, proprietary solutions with Linux-based solution
- ▸ Centralize configuration and management
- ▸ Consolidate many distributed TN3270 server instances into fewer server instances on zSeries
- ▸ Minimal or no change to z/OS, z/VM, or VSE/ESA SNA definitions
- ▸ IP flows all the way into the data center and into zSeries
  - – Wide area network infrastructure simplification (Reduced or no SNA skills needed in WAN)
  - – Gigabit Ethernet (QDIO) capacity connectivity to zSeries
- ▸ Secure TN3270 all the way into zSeries (no passwords in the clear outside the data center or the zSeries)

Same NETID Enterprise Extender gateway to z/VM and VSE/ESA

Added capability:
- ▸ Enterprise Extender is a highly efficient protocol to transport SNA flows over an IP network and is widely deployed by z/OS customers already
  - – Based on High Performance Routing (HPR)
- ▸ z/VM and VSE/ESA do not support Enterprise Extender protocols, but rely entirely on SNA-based connectivity, which uses lower capacity interfaces than those supported by IP on zSeries

Benefits of adding Enterprise Extender gateway capability:
- ▸ IP-based network flows to the data center and zSeries for all types of SNA traffic, including SNA program-to-program flows (that are not covered by the TN3270 protocol):
  - – LU type 0 (SLUTYPEP, NJE, etc.)
  - – LU type 6.2 (APPC, CPI-C)
- ▸ Enterprise Extender technology allows SNA traffic to take advantage of the dynamic nature of IP routing, enabling dynamic recovery from IP network topology changes to be extended to SNA workload.
- ▸ Enables zSeries operating systems that don't support Enterprise Extender technology to use SNA flows over an IP backbone network all the way into the data center or zSeries:
  - – Wide area network infrastructure simplification
  - – Gigabit Ethernet capacity connectivity to zSeries
- ▸ Enterprise Extender technology is already deployed in large scale by many existing z/OS customers to simplify the backbone network infrastructure
- ▸ For zSeries operating systems that are already APPN enabled, use of Linux as an Enterprise Extender gateway will require minimal or no changes to existing configuration

Consolidating SNA application gateway programs to Linux for zSeries

Consolidate SNA application gateway programs from:

- OS/2
- Windows
- Various SNA implementations on Tandem, Stratus, SUN, HP, etc.
- AIX

Benefits of consolidation onto Linux for zSeries:

- Replace heterogeneous, proprietary solutions with Linux-based solution
- Centralize configuration and management
- Provide a migration path off OS/2 that will not tie the customer into yet another proprietary operating system platform
- Stepwise deployment possible - greater deployment flexibility:
  - Deploy the gateway application on CS Linux initially
  - Consolidate the gateway application onto CS Linux for zSeries
- IP flows all the way into the data center and into zSeries
  - Wide area network infrastructure simplification (Reduced or no SNA skills needed in wide area network)
  - Gigabit Ethernet (QDIO) capacity connectivity to zSeries

Augment the value of Linux for zSeries installations

Some of the most widely used applications on Linux for zSeries are:

- WebSphere Application Server
- File and print sharing server (SAMBA)
- Database server

Communications Server for Linux on zSeries offers a new or increased value of zSeries installations:

- Consolidation of distributed TN3270 servers without modification to existing VTAM definitions
- A migration platform off OS/2 for SNA gateway applications
- A consolidation platform for SNA gateway applications in general
- Extension of the value of Enterprise Extender to the zSeries operating systems that do not currently support Enterprise Extender

- Existing zSeries installations are able to protect their investment in the current SNA-based application portfolio, but, at the same time, help reduce the overall cost of the networking infrastructure by making it a single-protocol network based on IP.

Linux on zSeries
Announcements in 2004

IBM.

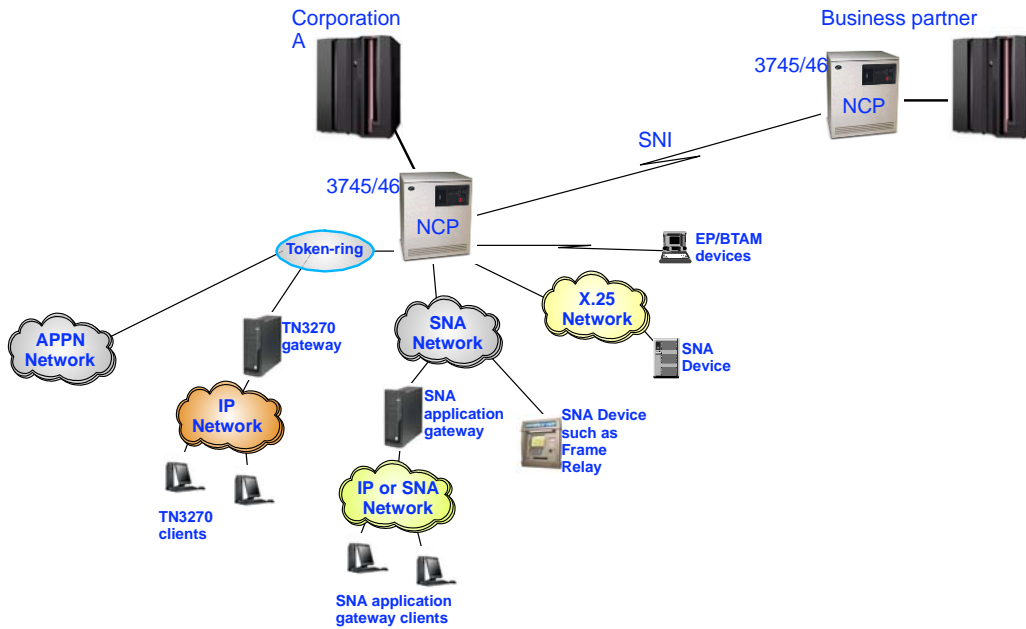## IBM Statement of Direction Update on SNA Support in 2004

IBM's plans to support SNA workloads have not changed since the Statement of Direction made in 2002. As of June 2004, customers can—for selected SNA workloads—use Communications Server products for Linux®, Linux on IBM eServer® zSeries®, Microsoft® Windows®, and AIX® to replace some of the old SNA infrastructure components, such as the IBM 3745/46 or other channel-attached SNA controllers. z/OS® Communications Server can replace some (SNA Network Interconnect) SNI workloads using Enterprise Extender and Extended Border Node functions.

It is IBM's intent to introduce an additional solution in 2005 that uses NCP software running within Linux on zSeries. The intent is to provide a migration path for customers who use traditional SNA (including SNA Network Interconnect (SNI)) to communicate with their Business Partners. This solution can allow them to continue using traditional SNA without a dependency on IBM 3745 and 3746 Communications Controller hardware.
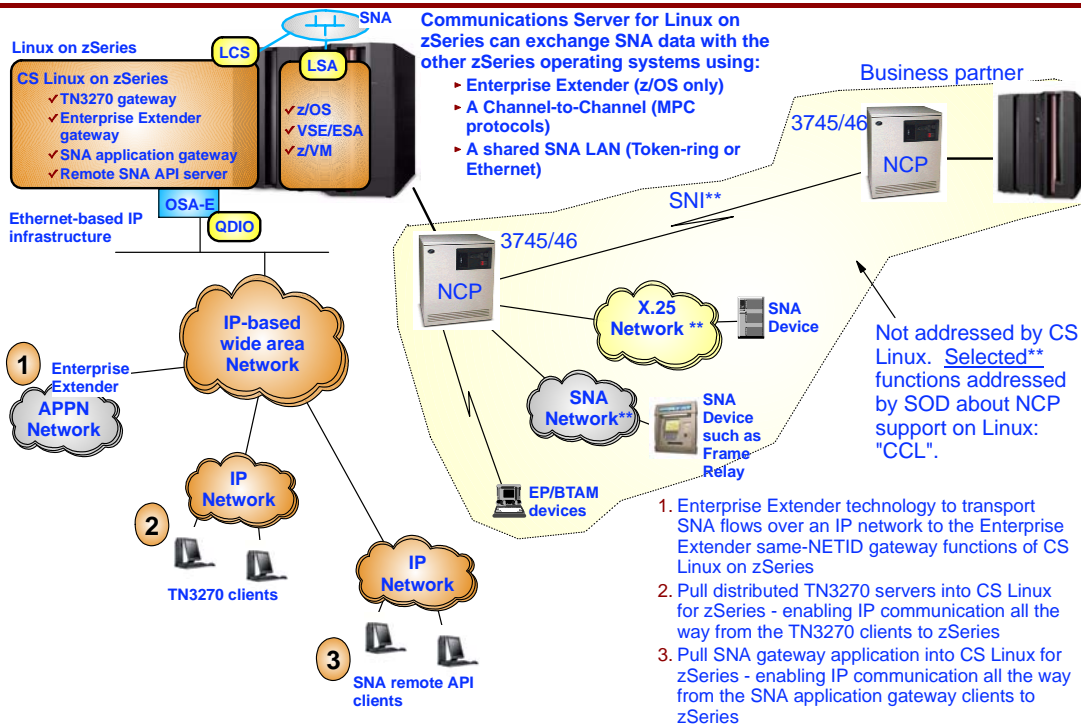
More information on IBM's Official Statement of Direction on SNA support on z/OS Communications Server is available at ibm.com/software/network/commserver/os390/

Traditional SNA Wide Area Networking Infrastructure

Corporation A

Business partner

3745/46 — NCP

3745/46 — NCP

SNI

Token-ring

EP/BTAM devices

APPN Network

TN3270 gateway

SNA Network

X.25 Network

IP Network

SNA application gateway

SNA Device

TN3270 clients

IP or SNA Network

SNA Device such as Frame Relay

SNA application gateway clients

Communications Server for Linux on zSeries reduces the dependency on the IBM 3745/46

Linux on zSeries

LCS

LSA

SNA

CS Linux on zSeries
- ✓ TN3270 gateway
- ✓ Enterprise Extender gateway
- ✓ SNA application gateway
- ✓ Remote SNA API server

- ✓ z/OS
- ✓ VSE/ESA
- ✓ z/VM

Communications Server for Linux on zSeries can exchange SNA data with the other zSeries operating systems using:
- ► Enterprise Extender (z/OS only)
- ► A Channel-to-Channel (MPC protocols)
- ► A shared SNA LAN (Token-ring or Ethernet)

OSA-E

QDIO

Ethernet-based IP infrastructure

Business partner

3745/46 — NCP

SNI**

3745/46 — NCP

1 Enterprise Extender

IP-based wide area Network

APPN Network

X.25 Network **

SNA Device

2 IP Network

SNA Network**

SNA Device such as Frame Relay

TN3270 clients

3 IP Network

EP/BTAM devices

SNA remote API clients

Not addressed by CS Linux. Selected** functions addressed by SOD about NCP support on Linux: "CCL".

1. Enterprise Extender technology to transport SNA flows over an IP network to the Enterprise Extender same-NETID gateway functions of CS Linux on zSeries
2. Pull distributed TN3270 servers into CS Linux for zSeries - enabling IP communication all the way from the TN3270 clients to zSeries
3. Pull SNA gateway application into CS Linux for zSeries - enabling IP communication all the way from the SNA application gateway clients to zSeries

Summary: Linux as Migration Path

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Summary: CS for Linux and CCL

✓ **Preserve use of existing SNA applications**

- ► IBM 3270 access
- ► SNA Client/Server
- ► SNA subarea business partner communication (SNI)

✓ **Replacement technology for selected IBM 3745/46 NCP functions will be provided by IBM**

- ► No need to migrate off SNA subarea technology

✓ **Linux on zSeries is an important component in an SNA to IP migration strategy**

- ► Skills in Linux on zSeries need to be established

✓ **With the existing and planned IBM provided technologies, CS for Linux on zSeries and Communication Controller for Linux on zSeries, it will be possible to define an SNA to IP network migration plan that supports:**

- ► Collapsing the physical SNA network to the zSeries or the data center
- ► Achieving full independence of SNA wide area network hardware and software components
- ► Removing needs for maintaining an SNA wide area network component skills base

Enterprise Networking Solutions

References

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References

- **IBM Communication Controller Migration Guide, SG24-6298**

- **zSeries Connectivity Handbook, SG24-5444**

- **Subarea to APPN Migration: VTAM and APPN Implementation, SG24-4656**

- **Subarea to APPN Migration: HPR and DLUR Implementation, SG24-5204**

- **Migrating Subarea Networks to an IP Infrastructure Using Enterprise Extender, SG24-5956**

- **SNA in a Parallel Sysplex Environment, SG24-2113**

- **For CS_LINUX Help:**
    - WWQ&A
    - Washington Systems Center Advanced Technical Support
    - Perform Contracts with April Singer, IBM Raleigh (next page) or with IGS

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    Gwen Dente - gdente@us.ibm.com
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90-day trial free download

> If you need assistance from CS for z/OS or Linux consultants who have experience designing and implementing network solutions for customers around the world, please contact April Singer at singeraf@us.ibm.com or 919-254-6762. April will work with you to provide a billable services offering specific to your needs, be it large or small.

Assistance That Your IBMer May Request from the WSC (Washington Systems Center)

WWQ&A and ATS Support through TECHEXPRESS -IBMers follow the following path:

1. Logon to URL w3.viewblue.ibm.com
2. Select QAAUTHOR
3. Select "Ask a Question"
4. Select Communications Systems (CSYS)
5. Select LINUX
6. Select Communications Server
7. Key in and Submit Question

For TechExpress requests for extended assistance (conference call with customer, assistance on a sale, fee assistance with a billable contract, etc.) - Submit a TECHEXPRESS request for zSeries Communications Server via the WEB at http://w3.ibm.com/support and select "Request Technical Sales Resources - Americas", or Gloria Grantman/Rochester/IBM can assist in opening a TechXpress. In either case, you will need the following information:

1. IBM Rep/Location for Notes
2. Customer Name/Geo
3. Brief Description of work/when
4. Platform/Op Sys/Application
5. Name of ATS Rep Performing
6. Other Info (CMT, OMSYS, PMR)
    OMSYS # ???????????????
    - or -
    Contract # ?????????????
    - or -
    CRITSIT # ?????????????
7. Revenue Potential

End of Topic

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