Modernizing the SNA Environment with CCL:

An Introduction to IBM's Communication Controller
for Linux on System z

Agenda

- Product Introduction
- Why do you care
- CCL Details
  - NCP Functions
  - Connectivity Options
  - Unsupported Functions
  - Additional Features
- An Enhanced Environment
  - Simplification
  - High Performance
  - High Availability
  - Enhanced Management
  - Enhanced Security
- Other migration alternatives
- Summary
- Resources

What is CCL?

- **C**ommunication **C**ontroller for **L**inux on System z
  - ▸ The next generation of IBM Communication Controllers
  - ▸ A mainframe software solution providing a "virtualized" Communication Controller
    - Runs in System z
    - Runs in a logical partition or as a z/VM guest
    - Runs in the Linux operating system, on an IFL or native Linux
  - ▸ Runs existing NCP and NPSI software

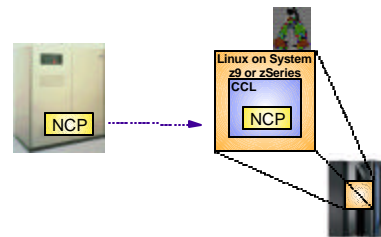| 3705	3725	3720	3745 & 3746		CCL
1974: IBM 3705 Communication Controller	1982: IBM 3725 Communication Controller	1985: IBM 3720 Communication Controller	1988: IBM 3745 Communication Controller	& IBM 3746 Multiprotocol Controller	2005: IBM Communication Controller for Linux

Linux on System z9 or zSeries

CCL

NCP

NCP

| 1975	1980	1985	1990	1995	2000	2005

Why is CCL Interesting?

- **CCL allows modernization of SNA application access while**

  - ▶ Preserving SNA applications in the datacenter and in the distributed environment

  - ▶ Enabling the networking infrastructure for seamless integration of SNA applications into a Services Oriented Architecture

  - ▶ Reducing overall network complexity by converging IP and SNA traffic onto a single common IP-based infrastructure, end to end

  - ▶ Reducing or removing dependencies on, and risks associated with, outdated networking hardware technologies such as IBM 37xx, Token-Ring LAN, ESCON, Cisco CIP, Cisco CPA, IBM 2216, etc.

  - ▶ Reducing SNA related support cost by consolidating SNA-related software and associated management and skills to the mainframe

  - ▶ Allowing customers to take advantage of zSeries, z/VM, IFL, etc benefits

CCL in Detail:
NCP Functions

▸ **Provides an alternative platform for running NCP software, supporting critical functions**

- ▪ SNI connectivity
- ▪ Boundary function
- ▪ X.25 NPSI interface

Business Partner A

Business Partner B

CCL on Linux

VTAM

NCP

SNI

NCP

VTAM

IBM 3745/46
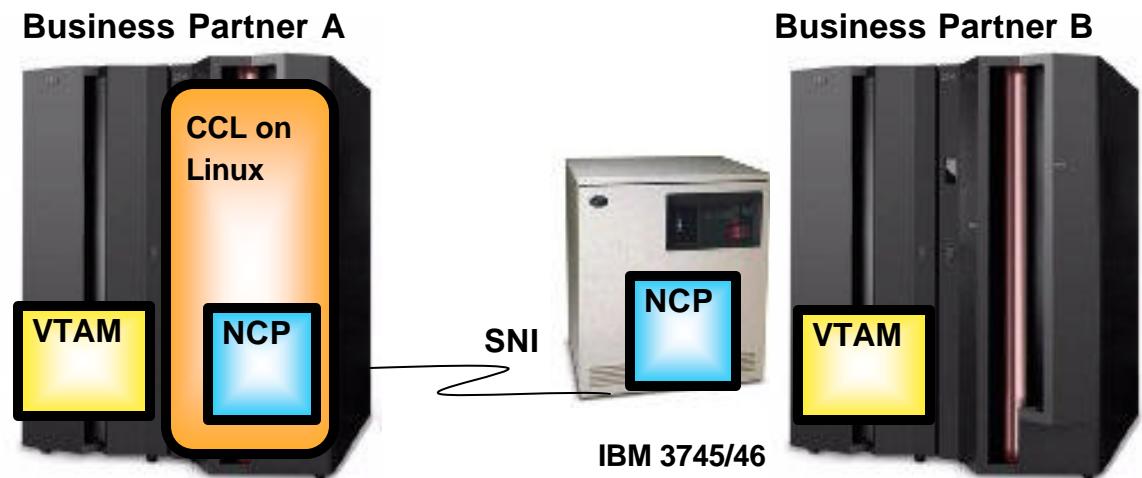
CCL in Detail:
NCP Functions (cont.)

- Extended Recovery Facility (XRF) and Network Routing Facility (NRF)

- SSCP Takeover/giveback

- Duplicate TIC

- Same or similar operations through VTAM commands, web-accessible MOSS console, etc.

- Continued network tuning and management support through NTuneMon, Tivoli NetView for z/OS, etc.

CCL in Detail:
Connectivity Options

▶ **Physical connectivity to a CCL NCP is through OSA on System z**

- Token-Ring
- Ethernet
- Channel
  - CDLC support through OSN (TPF support)
- Serial lines (SDLC, Frame Relay)
  - Terminate at an Aggregation Layer Router
- X.25
  - With an XOT product such as Eicon's XOT Software Adapter*

*On October 25, 2005, IBM announced the IBM Communication Controller for Linux for System z9 and zSeries V1.2, which provides an X.25 NPSI enablement interface. This function allows a software vendor to deliver support for an X.25 over TCPIP network. It is IBM's intent to also release an IBM X.25 over TCPIP product which uses this X.25 NPSI enablement interface.

Together, the Communication Controller for Linux on System z and X.25 over TCPIP products can help customers modernize their networking infrastructure for Communications Server on z/OS.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

CCL in Detail:
Unsupported Functions

- Functions not supported and cannot be migrated to CCL
    - ▸ EP BSC, NCP BSC, BSC RJE
    - ▸ NTO, XI, NSF, NSI
    - ▸ 3746 Network Node Processor functions

    - ▸ Note: You may be able to consolidate unsupported functions to a single 3745 and move remaining NCPs to CCL

CCL in Detail:
Additional Features

▶ **CCL features not available on 3745s**

- Ethernet connectivity

- QDIO Layer 2 support and z/VM VSWITCH support

- DLSw support for IP connectivity all the way into the mainframe

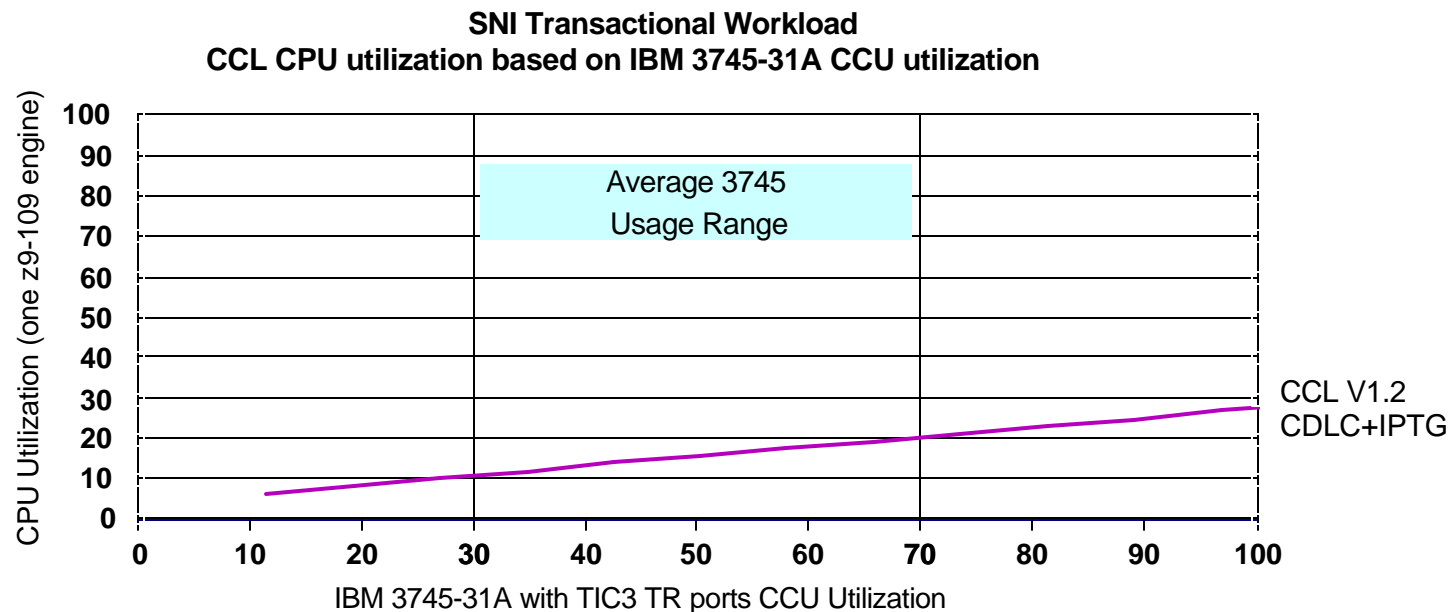- IP Transmission Group (IPTG) connections between CCL NCPs

The Enhanced CCL Environment:
Simplification

- **CCL simplifies the SNA hardware topology**
  - ▶ Reduces raised floor space and power and cooling requirements
  - ▶ Reduces ESCON requirements
  - ▶ Removes the need for Token Ring LAN technology

The Enhanced CCL Environment:
High Performance

- ## CCL outperforms 3745 hardware

  - ▸ CCL SNI NCPs connected over IPTG performs up to 5 times better than SNI NCPs running in real 3745/3746s

  - ▸ Up to five NCPs running at about 70% 3745 CCU utilization could be consolidated onto a single System z9 IFL engine

SNI Transactional Workload
CCL CPU utilization based on IBM 3745-31A CCU utilization

CPU Utilization (one z9-109 engine)

Average 3745 Usage Range

CCL V1.2 CDLC+IPTG

IBM 3745-31A with TIC3 TR ports CCU Utilization

The Enhanced CCL Environment:
High Availability

- **CCL provides a high-availability environment for the NCP**
  - ▶ 3745 and NCP high-availability features continue to work much as they do today
    - Duplicate MAC addressing expanded to Ethernet environment
  - ▶ Redundant stand-by NCPs can be deployed without acquiring additional hardware CCUs or ESCON channel hardware
  - ▶ NCPs can be set up at a disaster recovery site without requiring additional 3745 hardware
  - ▶ CCL runs on System z and inherits all of the unique availability features of the System z platform

The Enhanced CCL Environment:
Enhanced Management

- ■ **CCL continues to support existing management options**
  - ▶ Current SNA management tools such as NTuneMon and NPM continue to work with CCL

- ■ **Linux offers new management opportunities**
  - ▶ Tivoli OMEGAMON for Linux
  - ▶ Tivoli OMEGAMON XE
  - ▶ Tivoli OMEGAMON for z/VM
  - ▶ Tivoli System Automation for Multiplatforms

The Enhanced CCL Environment:
Enhanced Security

- **Enhanced Security Options with CCL**
  - ▶ IP-based security can be extended to the IP-based CCL connectivity options
    - DLSw and XOT flows into CCL can be protected using standard IP security (IPSec/VPN)
    - INN or SNI flows between partner CCL NCPs connected through IPTG can be protected using SSH tunneling or IPSec security
      - – Simplified firewall configuration
- **SNA Session Level Encryption (SLE) continues to be a SNA-based security option**

Migration Alternatives

- **Options for modernizing SNA access:**
  - ▸ **Stay with Subarea architecture / NCP**
    - Preserve existing topology (VTAM, NCP, peripheral nodes)
    - Preserve existing SNI connections to business partners
    - Move NCP and NPSI to CCL
    - Use SNA over IP protocols (DLSw, XOT, IPTG)
  - ▸ **Migrate SNA topology to APPN HPR**
    - Use Enterprise Extender to send SNA over IP
    - Use DLUR/DLUS to preserve subarea resource access
    - Use APPN EBN connectivity to other APPN networks
  - ▸ **Or do both**
    - Some partners may be able to connect over EE while others may still require SNI

Migration Alternatives (cont.)

- **Enterprise Extender Option**
  - ▶ Requires APPN and HPR enablement in a z/OS environment
  - ▶ Not supported on VM, VSE, TPF
  - ▶ Requires coordinated action by both endpoints
  - ▶ Uses UDP packets which causes problems for firewall administrators

- **Move resources to another machine or directly through OSA**
  - ▶ Does not support SNI business partner connections
  - ▶ VTAM solution uses limited address pool and z/OS mips
  - ▶ Limits modernization of SNA application access

Migration Alternatives (cont.)

- **Rewrite SNA apps to IP**
  - ▶ Expensive
  - ▶ Introduces unnecessary risk
  - ▶ May not have all the functions of the SNA application

"We would regard 'rip and rewrite' as a last resort. We've seen far too many projects of this nature flounder to regard it as an obvious choice."

Gary Burnett, *The Future of the Mainframe*, www.ovum.com, 10/04/2005

Summary

- CCL provides an option for 3745 migration that customers are looking for

- It supports key NCP functions and connectivity as well as providing additional features unique to the CCL environment

- It provides an enhanced platform for running NCP with improvements in simplification, performance, availability, management, and security

- It has advantages over other migration alternatives, while still supporting modernization of SNA application access

"(CCL) provides NCP with a whole new lease of life, on a highly-strategic, mission-critical, hardware platform."

Anura Guruge, *IBM Communication Controller for Linux on System z9 and zSeries V1R2: A Mainframe Linux Virtual 37xx for ACF/NCP*, www.itindepth.com, October 2005

CCL Reference

Resource	Location
CCL web site	http://www.ibm.com/software/network/ccl
Supported features cross reference	http://www.ibm.com/support/docview.wss?rs=2192&uid=swg27005874
Frequently asked questions	http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/FQ109582
CCL Implementation Redbook & 3745 Migration Guide Redbook	http://www.redbooks.ibm.com/redbooks.nsf/redbooks/
Capacity planning guide	http://www.ibm.com/support/docview.wss?rs=2192&uid=swg27006207
Configuration samples	http://www.ibm.com/support/search.wss?tc=SSRRLB&rs=2192&dc=DB520&rank=8&q=cclconfigsample
Consultant whitepaper	http://www.ibm.com/support/docview.wss?rs=2192&uid=swg27006789