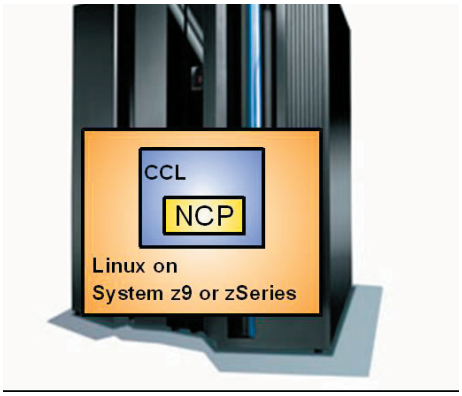
Migrate off of aging hardware while preserving software reliability

IBM Communication Controller for Linux on System z9 and zSeries V1R2



Highlights

- ***Provides migration path from IBM 37xx Communication Controller hardware while preserving investment in mission-critical SNA applications.***
- ***Runs reliable NCP software, supporting many key functions including SNI, INN, and boundary function.***
- ***Provides an enablement interface for NPSI X.25 connectivity.***
- ***Provides improved connectivity to VTAM via the OSA-Express2 Open System Adapter for NCP (OSN) support, and improved connectivity between CCLs via IPTG.***
- ***Reduces CPU utilization requirements while increasing throughput.***
- ***Runs on Linux operating system, either in native LPAR mode or in a z/VM LPAR on reliable System z9 and zSeries hardware.***
- ***Focuses on ease of migration, running existing NCP code with minimal network definition updates.***
- ***Preserves strategic business-to-business connections, with no dependency on coordinated network updates by business partners.***
- ***Requires no changes to network management products such as Tivoli Netview for z/OS and NTune***

Companies are simplifying their networks and moving toward an on demand environment. They want to move off of older, slower networking hardware and be able to take advantage of newer technology. At the same time, they want to preserve their investment in their current application portfolio and continue to use solutions they have come to rely on. IBM's Communication Controller for Linux™ on System z9™ and zSeries® is software that emulates IBM 3745 hardware and runs in the mainframe. Communication Controller for Linux (CCL) provides an attractive migration solution, integrating the latest networking hardware with mission-critical existing software.

New for V1R2

The second release of IBM's Communication Controller for Linux on System z9 adds functions which make it an even more viable IBM 37xx replacement option. Channel datalink control (CDLC) support using the OSA NCP (OSN) mode provides direct connectivity between CCL and mainframe operating systems, including z/OS, VM, VSE, and TPF. A NPSI x.25 enablement interface

will allow software vendors to deliver support for x.25 over TCP/IP (XOT). New exploitation of layer 2 support for OSA Express adapters allows the use of fiber OSAs for CCL connectivity and supports multiple virtual MAC addresses, further improving CCL OSA sharing and efficiency. In addition, multiple performance improvements are included in release 2. CCL internal processing improvements lead to significantly reduced CPU utilization and increased throughput. And the new IPTG function will allow IP connectivity to be used between CCL NCPs.

Alternative Hardware Option

The IBM 37xx Communication Controller hardware family was withdrawn from marketing in 2002. The IBM Communication Controller for Linux on System z9 and zSeries (CCL) was developed as a migration path from this hardware. CCL enables the Network Control Program (NCP) software that runs on IBM 37xx hardware to now run in Linux on z9 or zSeries hardware. The result is replacement of dependencies on older 37xx hardware with newer z9 or zSeries hardware and Linux software. And the mainframe Linux platform is a strategic environment for running many key software solutions along with CCL.

In the past, IBM 37xx NCPs were connected to your host via token-ring or ESCON channel attachments. Many token-ring products are also being withdrawn from marketing and ESCON channel chips are no longer manufactured. In addition to moving the NCP into flexible z9 or zSeries Linux servers, running your NCP in Communication Controller for Linux also provides an alternative Ethernet connection into the host, removing another non-strategic hardware dependency.

Network Consolidation

Communication Controller for Linux on System z9 and zSeries supports consolidation of many of your SNA network components into the mainframe where VTAM® and the mainframe SNA applications reside. At the same time, it supports consolidation of your network infrastructure to IP. Most traffic enters and leaves CCL as SNA network flows over an OSA adapter. However, your wide area network infrastructure does not need to be SNA. You can consolidate your traffic and use tunneling such as data link switching (DLSw) to encapsulate the SNA communication over an IP network or x.25 over TCP/IP (XOT) to send x.25 traffic over IP. And using the CCL IPTG function, SNA flows between CCL NCPs can go over IP, all the way into the mainframe. Bringing NCP into the mainframe and consolidating your network infrastructure to IP can decrease complexity and skill requirements throughout the network. At the same time, CCL allows you to continue using the applications you count on today without requiring a rewrite to IP, simplifying migration and ensuring continued reliability.

Connectivity Options

The main difference between running NCP in a IBM 37xx and running it in the mainframe is in the area of network connectivity. Connectivity to Communication Controller on System z9 and zSeries is through OSA adapters. In V1R1, connectivity from CCL to the network and VTAM required a copper OSA port running in LCS mode. In V1R2, layer 2 support has been added for connectivity from CCL. This uses QDIO mode and lets you use any OSA Express adapter including fiber. OSA with layer 2 support has the added advantage of supporting virtual MAC addresses, so that one physical port may be associated with multiple addresses and appear as many ports to the network.

Connectivity from VTAM to CCL may still be through a second OSA port running in LSA mode, as was required in CCL V1R1. Or, for V1R2, the connectivity between VTAM and CCL may use channel datalink control (CDLC) which has been added through the OSA in NCP mode (OSN) feature available on the System z9.

Connectivity between two CCL NCPs may also take advantage of the V1R2

IPTG function. This allows the SNA traffic between the CCL NCPs to flow over an IP network all the way into the mainframe.

The CCL LAN connectivity through OSA may be either token ring or Ethernet. From an NCP perspective, NCP only supports SNA traffic over token ring LAN connections, so if Ethernet is used, CCL maps the Ethernet frames to token ring before sending them to NCP. IBM's 37xx hardware supports a variety of other non-LAN connectivity types, including x.25, SDLC, and frame relay. In order to migrate these connections from the older hardware to CCL, you have to terminate them at a WAN aggregation layer router and map them to the CCL NCP's LAN connection.

Ease of Migration

Because CCL was developed as a migration solution, simplifying migration was a key focus area. Existing NCP software, with no required code changes, runs in Linux on z9 or zSeries. Some NCP definition updates might be needed, for example adding a token-ring line definition if you do not already have one. CCL preserves your SNA subarea network topology and does not require APPN. Coordinated changes on the part of business partners are also not required. An NCP running in CCL can connect to another CCL NCP or to an NCP running in IBM 37xx, so migration can be staged. And CCL provides interfaces to load, operate, manage, and dump NCPs in a manner similar to operating NCP on an IBM 37xx.

If using NPSI, mainframe NPSI application and NPSI setup is as usual. And NCP management tools such as NTuneMON and Network Performance Monitor (NPM) continue to be supported.

NCP Functionality

Many key NCP functions now run in the Linux on z9 or zSeries platform using Communication Controller for Linux. SNA Network Interconnectivity (SNI) for business-to-business communication across networks is supported. As previously stated, migration on the part of the attached business partner is not required. Intermediate Network Node (INN) for communication between subareas within the same network is also supported.

In addition, selected boundary functions for Boundary Network Node (BNN) traffic are supported providing connectivity to SNA peripheral nodes. Continuing to connect these resources through NCP preserves the network topology. NCP boundary function support includes multiple availability functions. SSCP Takeover and Giveback and Extended Recovery Facility (XRF) will work as they do today. Redundant CCLs and NCPs can be defined using duplicate MAC addresses for load balancing and availability of NCPs and OSA ports. Functionality similar to IBM 3745 twin CCU configurations is available and CCL could also provide an alternative disaster recovery solution in place of a redundant 37xx installation.

NPSI support via the use of an x.25 over TCP/IP (XOT) product is provided. NPSI running on CCL will continue to have the same x.25 capabilities. XOT will be used to transport the x.25 traffic. Since the x.25 traffic will need to come into the mainframe over an OSA port, the XOT endpoint has to be inside the box. CCL provides an open interface to enable vendors to provide this mainframe XOT function.

CCL Components

The IBM Communication Controller for Linux on System z9 and zSeries consists of three components, the Engine, the Network Device Handler, and the MOSS console. The CCL Engine allows NCP to run unchanged in Linux on z9 or zSeries. Each instance of the CCL Engine loads one NCP. Multiple CCL Engines can run in one Linux image. The Network Device Handler (NDH) provides the interface from the Linux device driver to the CCL Engine. If applicable, the NDH bridges the Ethernet frames to token-ring. The CCL MOSS console is a browser interface that provides functions similar

to the IBM 37xx MOSS console.

Linux on System z9 or zSeries Advantages

Not only does CCL reduce your dependency on aging hardware, running NCP in Linux on mainframe servers provides many other advantages. You can leverage the strengths of z9 and zSeries hardware, known for its reliability, security, scalability and business resiliency.

You can run Communication Controller for Linux on System z9 and zSeries with Linux running in either native LPAR mode or as a z/VM guest. You can also use IBM's Integrated Facility for Linux (IFL). Communication Controller for Linux on System z9 and zSeries is an attractive migration alternative integrating the advantages of z9 and zSeries hardware, virtual servers, and the Linux operating system with the reliability of your existing NCP software and SNA applications.

For More Information

To learn more about the IBM Communication Controller for Linux on System z9 and zSeries V1R2, visit: ibm.com/software/network/ccl

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IBM Communication Controller for Linux on System z9 and zSeries at a glance

Component or related application:	Features:

NCP Support	• Runs existing NCP code
	• Supported NCP functions:
	  • SNI
	  • INN
	  • BNN
	  • XRF
	  • NRF
	  • SSCP Takeover and Giveback
	  • Duplicate MACs
	  • Load and dump over CDLC connections

NPSI Support	• Support of X.25 Over TCP/IP (XOT) interface
Installation, Configuration, and Administrative Options	• Installation via CCL InstallShield • Can be automatically started during Linux boot • NCP load module is Linux file • VTAM operator commands and CCL MOSS console operation both supported
Problem Determination and Systems Management	• Diagnostic traces of data flows to/from NCP, CCL components, VTAM, network • Support of NCP dumping and restarting functions with faster availability • CCL Engine dumps available • Continue use of network management products such as Tivoli® NetView® and NTuneMON

Requirements:	Features:

Hardware	• Communication Controller for Linux on System z9 and zSeries will run in a G5/G6, z800, z890, z900, z990, or System z9.
	  • For CDLC support, System z9 with z/OS V1.4 or higher, with APARs OA11238 and OA07875 (for OSN CHPID support in IOS and HCD) or z/VM V5.1, or higher: VM63722 (for OSN CHPID support on z/VM)
	  • For layer 2 support, zSeries z990 or later with z/VM V5.1 with Layer 2 support in PTF for APAR VM63538. (Refer to the 2084/2086 PSP buckets for any additional required service.)
	
	• OSA adapters supported
	  • For LCS or LSA mode, OSA-2 ports in non-shared mode
	  • For LCS or LSA mode, OSA Express ports in shared or non-shared mode (z800 or z900 MCL 3.5, z890 or z990 MCL 5.50)
	  • For CDLC, OSA Express2 with OSN support (3364, 3365, 3366)
	  • For layer 2, OSA Express or OSA Express2 with layer 2 support (1364, 1365, 1366, 2364, 2365, 2366, 3364, 3365, 3366, 3368)

Software	• CCL requires one of these Linux operating system distributions:
	  • SUSE Linux Enterprise Server 8 for IBM zSeries and IBM s/390® (SLES8); minimum level SP4
	  • SUSE Linux Enterprise Server 9 for IBM zSeries and IBM s/390 (SLES9); minimum level SP2
	  • Red Hat Enterprise Linux V4 (31-bit and 64-bit) (RHEL4) + Update 1 (U1)
	  • Note: CDLC and layer 2 will require a Linux kernel update; see the CCL Web site for specifics.
	• CCL supports NCP V7R5 or later
	• For x.25, NPSI V3R8 or later and XOT server software provided by an ISV
	• SSP, NRF, and NTuneMON supported by the NCP release are supported
	• CCL requires a VTAM APAR to support activation and loading of CCL NCP resources (for VTAMs prior to V1R7):
	  • VM/VTAM 4.2 APAR VM63677
	  • VSE/VTAM 4.2 APAR DY46311
	  • OS/390® Communications Server V2R10 APAR OA10425
	  • z/OS® Communications Server V1R2 APAR OA10425
	  • z/OS Communications Server V1R4 APAR OA10425
	  • z/OS Communications Server V1R5 APAR OA10425
	  • z/OS Communications Server V1R6 APAR OA10425
	• GCC C Compiler and C Compiler Utilities
	• Make is required to process the makefile
	• OSA-SF to configure the OSA LAN connectivity if applicable

Memory and Storage	• DASD for CCL = 50 MB • DASD for CCL traces, dumps, logs, NCP load modules = 80-100 MB per CCL Engine instance • DASD for Linux is approximate DASD space equivalent to two 3390-3 DASD volumes • Memory required per CCL Engine instance - 20 MB • Memory for Linux approximately 300 MB depending on distribution, packages, and kernel level