

IBM Communication Controller for Linux on System z Version 1 Release 2.1

Supported features cross reference

The following tables summarize which functions of the IBM Communication Controllers (IBM 3705, 3720, 3725, 3745, and 3746) and the associated software components are supported in a Communication Controller for Linux on System z (CCL) Version 1 Release 2.1 environment.

The “*Communication Controller for Linux on System z Implementation and User’s Guide*”, SC31-6872 has more information about CCL Release 2.1 and the functions it supports.

The “*IBM Communication Controller for Linux on System z V1.2.1 Implementation Guide*”, SG24-7223 Redbook discusses how to plan for and how to implement CCL Release 2.1.

The “*IBM Communication Controller Migration Guide*”, SG24-6298 Redbook contains more details about IBM 3745/46 migration in general and identifies alternative technologies for many of the functions that are not supported in a CCL environment

Please note that since CCL executes on System z hardware, it cannot directly support attachment of any serial lines. Indirect attachment of selected types of serial lines is supported via aggregation layer routers.

An aggregation layer router is a traditional router with serial line interfaces. The aggregation layer router uses router-specific technologies to switch or bridge the SNA traffic between the supported serial lines and SNA LLC2 traffic on a local area network to which the CCL NCP is attached through an OSA adapter operating in either LCS mode or in QDIO layer-2 mode. An example of an aggregation layer router is a Cisco 3700, 1800, 2800, 3800, or 7200 family router. Other router vendors support similar technologies.

CCL R2.1 also supports non-SNA X.25 traffic via an aggregation layer router, where X.25 circuits are terminated in the router and the router exchanges the X.25 packets with Linux on System z using the X.25 over TCP (XOT) protocol. XOT support on Linux for System z is not part of CCL, but is offered by a vendor product – please see the following Web site for more information: <http://www.eicon.com/worldwide/products/WAN/EXOT.htm>

CCL R2.1 supports DLSw connectivity into Linux on System z allowing a downstream DLSw router to use IP connectivity all the way into Linux on System z where the DLSw TCP connections are terminated and the SNA traffic is switched to an internal SNA LLC2 connectivity to CCL NCP.

In addition, CCL R2.1 supports an optimized direct TCP/IP connectivity between two CCL NCPs for INN or SNI traffic. Such connectivity is referred to as IP Transmission Group (IP-TG).

The following pages provide a quick overview of which functions are supported by CCL and of which functions that are not supported by CCL.

Table 1: Quick functional overview on page 2 provides a high-level overview of which software components and which connectivity options are supported by CCL.

Table 2: Detailed functional support information on page 3 provides a detailed functional break-down of which functions and options are supported by CCL.

Table 3: Software release compatibility overview on page 6 provides an overview of compatible software releases in a CCL environment.

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Table 1: Quick functional overview

| CCL R2.1 supports | CCL R2.1 support of serial lines via an aggregation layer router | CCL R2.1 does not support |
|---|---|---|
| Software: <ul style="list-style-type: none"> • NCP (V7R5 or later) and compatible levels of NRF • NPSI (V3R8 or later) • SSP, NTuneMON, NetView, and NPM continue to work as they have in the past | | Software: <ul style="list-style-type: none"> • Other IBM 3745 software products: XI/NSF, EP, NTO, NSI, MERVA, or TPNS • Functions provided by the IBM 3746 NNP and MAE • NCP-based IP routing |
| Physical network interfaces: <ul style="list-style-type: none"> • SNA LLC2 over 4/16/100 Mb token-ring and 10/100/1000 Mb Ethernet LAN attached through OSA Express ports operating in LCS mode (copper-based cabling) • SNA LLC2 over 1000BASE-T, Gigabit, and 10 Gigabit Ethernet OSA Express ports on z890, z990, and system z9 – operating in QDIO layer-2 mode (copper or fiber-based cabling) • SNA CDLC channel connectivity on System z9 to same-CEC SNA operating systems (z/OS, z/VM, z/VSE, and z/TPF) through a 1000BASE-T or Gigabit Ethernet feature on OSA-Express2 – operating in OSA for NCP (OSN) mode • IP-based connectivity for IP Transmission Group INN and SNI communication between CCL NCPs • IP-based connectivity for Data Link Switching (DLSw) to a downstream DLSw node, such as a remote router that is connected over an IP wide area network to the data center • IP-based connectivity for NPSI non-SNA X.25 traffic via X.25 over TCP (XOT) to an aggregation layer router where X.25 circuits are terminated. | Physical network interfaces: <ul style="list-style-type: none"> • SDLC, Frame Relay, X.25 QLLC, and ISDN serial line interfaces are not supported directly by CCL, but are supported via an aggregation layer router • X.25 circuits for non-SNA X.25 traffic to/from NPSI are not supported directly by CCL, but are via an aggregation layer router that uses the XOT protocol to transport the X.25 packets to/from an XOT protocol component on Linux interfacing to NPSI running in CCL | Physical network interfaces: <ul style="list-style-type: none"> • BSC, ALC, Start/Stop |

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Table 2: Detailed functional support information

| Communication Controller physical network interfaces | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
|---|---------------------------------------|--|----------------------------------|--|
| Communication lines | | Some | Some | System z hardware does not support direct communication line attachment to CCL. Some serial lines can be terminated in an aggregation layer router and SNA data switched to a LAN to which CCL is attached using an OSA adapter. See below for more details. |
| Token-Ring LANcopper cabling | 0 | | | 4/16/100 Mb token-ring |
| Ethernet LANcopper cabling | 0 | | | 10/100/1000 Mb Ethernet (1000BASE-T) |
| Ethernet LAN Fiber optic cabling | 0 | | | Gigabit and 10 Gigabit Ethernet |
| 3745 TIC2 adapter support | 0 | | | TIC2 LINE addresses and mode of operation |
| 3746 TIC3 adapter support | 0 | | | TIC3 LINE addresses and mode of operation |
| FDDI | | | - | FDDI is supported by the MAE, not the NCP. |
| ATM | | | - | ATM is supported by the MAE, not the NCP. |
| Channel attachment | 0 | | | OSA for NCP (OSN) on System z9 |
| NCP link-level protocol functions | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
| Air Lines Control (ALC) | | | - | See SG24-6298 for alternative technologies. |
| SNA BSC lines for access to SNA 3270 applications | | | - | See SG24-6298 for alternative technologies. |
| Frame Relay | | 0 | | Works via an aggregation layer router. Has been tested for both peripheral and subarea links. |
| Integrated Services Digital Network (ISDN) | | (0) | | Is expected to work via an aggregation layer router, but has not yet been tested. |
| X.21 | | (0) | | Is expected to work via an aggregation layer router, but has not yet been tested |
| Token-Ring LAN and Ethernet LAN– both TIC2 and TIC3 NCP LINE addresses | 0 | | | Supported by CCL using an OSA port operating in LCS mode (copper cabling only), or QDIO layer-2 mode (copper or fiber cabling) |
| Start/Stop lines connected to TCAM | | | - | See SG24-6298 for alternative technologies. |
| Synchronous Data Link Control (SDLC) | | 0 | | Works with an aggregation layer router. Has been tested for both peripheral and subarea links. |
| X.25 SNA QLLC (with licensed support feature on IBM 3746) | | 0 | | Is supported without NPSI and works with an aggregation layer router. Has been tested for both peripheral and subarea links. |
| CCL-unique NCP connectivity functions | Directly Supported by CCL R2.1 | | | |
| IP-based connectivity via integrated DLSw support in CCL to local/remote DLSw node | 0 | | | DLSw connectivity is supported for both subarea links and boundary function links. |
| IP-based connectivity via IP Transmission Group to partner CCL NCP for INN or SNI traffic | 0 | | | IP-TG connectivity is supported for subarea links to NCPs that also run in CCL R2 or higher. |

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| NCP advanced functions | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
|--|---------------------------------------|--|----------------------------------|--|
| SNA Class of Service (COS) | 0 | | | |
| Multi-Link Transmission Group (MLTG) | 0 | | | MLTG over multiple LAN adapters is supported. Please note that MLTG is not supported by DLSw technology. |
| SNA subarea addressing, routing, and boundary functions (BF) | 0 | | | |
| SNA Network Interconnect | 0 | | | |
| APPN (and LEN) Composite Network Node (CNN) | 0 | | | CNN is an APPN node that is composed of the combined functions of an NCP and VTAM. |
| IP Routing | | | | These functions are better handled by a traditional IP router. |
| EXtended Recovery Facility (XRF) | 0 | | | |
| NTuneMON | 0 | | | |
| Network Performance Analyzer PU/LU | 0 | | | Network management products based on the NPA LU will for most functions work as today. Some data items are not reported by the NPA LU when operating in a CCL environment. |
| NCP Packet Switching Interface (NPSI), X.25 Interconnect (XI), and Network Supervisory Function (NSF) | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
| NPSI program product support | 0 | | | |
| NPSI SNA (PSH and QLLC) communication over X.25 connectivity | | 0 | | QLLC is supported with or without NPSI by terminating the X.25 QLLC lines in an aggregation layer router. |
| NPSI non-SNA (PCNE, GATE, DATE, and PAD) communication over X.25 connectivity | | 0 | | Non-SNA X.25 with NPSI is supported by terminating the X.25 circuits in an aggregation layer router that communicates using an XOT protocol to an XOT protocol component on Linux that interfaces to NPSI running in CCL |
| XI and NSF transport of X.25 traffic | | | | See SG24-6298 for alternative technologies. |
| NSF-based charge-back for X.25 transport services | | | | See SG24-6298 for alternative technologies. |
| Emulation Program (EP), Partitioned Emulation Program (PEP), and Network Terminal Option (NTO) | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
| EP/PEP BSC 3270 terminal connection to non-SNA applications | | | | See SG24-6298 for alternative technologies. |
| EP/PEP BSC RJE connection to non-SNA applications | | | | See SG24-6298 for alternative technologies. |
| EP/PEP Start/Stop terminal connection to non-SNA applications | | | | See SG24-6298 for alternative technologies. |
| NTO Start/Stop terminal connection to SNA applications | | | | See SG24-6298 for alternative technologies. |
| NTO BSC RJE connection to SNA applications | | | | See SG24-6298 for alternative technologies. |
| NTO peer-to-peer connection of non-SNA devices | | | | See SG24-6298 for alternative technologies. |

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| Network Routing Facility (NRF) and non-SNA Interconnect (NSI), MERVA, and TeleProcessing Network Simulator (TPNS) | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
|--|---------------------------------------|--|----------------------------------|---|
| NRF peer-to-peer connection of SNA devices (before SNA PU Type 2.1) | 0 | | | |
| NRF peer-to-peer connections involving non-SNA devices | | | - | This function requires NTO, and NTO is not supported by the CCL Release 1 environment. |
| NSI non-SNA NJE to NJE connections between hosts | | | - | See SG24-6298 for alternative technologies. |
| NSI transport of BSC traffic | | | - | See SG24-6298 for alternative technologies. |
| MERVA connection to the S.W.I.F.T network | | | - | See SG24-6298 for alternative technologies. |
| TPNS NCP | | | - | TPNS traffic through a CCL NCP is supported, but the TPNS NCP itself is not supported in a CCL environment. |
| Network Node Processor (NNP) and Multi-Access Enclosure (MAE) functions | Directly Supported by CCL R2.1 | Supported via an Aggregation Layer router | Not Supported by CCL R2.1 | Comments |
| NNP or MAE APPN Network Node including HPR and DLUR support | | | - | These functions can optionally be migrated to Communications Server for Linux on zSeries. See SG24-6298 for additional alternative technologies. |
| NNP or MAE IP routing | | | - | These functions are better handled by a traditional IP router. |
| MAE TN3270 server | | | - | These functions can optionally be migrated to Communications Server for Linux on zSeries or directly to z/OS, z/VM, or z/VSE. See SG24-6298 for additional alternative technologies. |
| MAE Network Dispatcher | | | - | These functions can optionally be migrated to an external load balancer or to z/OS itself using the Sysplex Distributor functions. See SG24-6298 for additional alternative technologies. |

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Table 3: Software release compatibility overview

| Software product | Compatible releases for CCL Release 2.1 | | | | |
|-------------------------|--|-----------------|-----------------|-----------------|-------------------|
| NCP V7 | R5 | R6 | R7 | R8 | R8.1 ¹ |
| NPSI V3 | R8 | R8 | R9 | R9 | R9 ¹ |
| SSP V4 | R5 ² | R6 ² | R7 ² | R8 ² | R8.1 ¹ |
| NTuneMON V3 | R2 | R2 | R2 | R2 | R2 ¹ |
| NRF V1 | R9 | R9 | R9 | R9 | R9 ¹ |

Notes:

1. Releases that currently (May 2006) can be ordered
2. Or later releases