

## IBM 3745 Communication Controller

- **High-performance communications controller meeting user demands for high availability and enhanced connectivity**
- **Range of models featuring 4-MB to 16-MB storage, high performance Token-Ring, high connectivity communication line adapters and up to 16 parallel channel adapters for connection to S/390® servers**
- **Excellent network management facilities fully supported by IBM's NetView® program**



3745 Models 170/17A



3745 Models 21A/31A/41A/61A

The IBM 3745 Communication Controller family offers a range of models designed to provide multiple networking solutions. Since its introduction, the 3745, with its ACF/NCP programming support, has constantly evolved to meet user demands for enhanced connectivity, performance and availability.

# Product Overview

The IBM 3745 Communication Controller is a high-performance controller that offers a range of models with the following features:

- 4-MB to 16-MB storage per CCU
- Up to 16 parallel channel connections to the S/390 server
- Up to 896 low- and medium-speed line attachments
- Up to 8 high-speed lines for attachment to T1 or E1 circuits
- Up to 16 attachments to Ethernet Version 2 or IEEE 803.2 LANs
- Up to 8 IBM Token-Ring attachments operating at 4 Mbps or 16 Mbps

The IBM 3745 family includes:

- **Model 170:** The 3745 Model 170 is the ideal migration vehicle for those customers running small to medium sized networks with 3705/3725/3720. The 3745 Model 170 and the 3745 Model 17A have identical connectivity and performance features. The only difference is that the Model 170 does not have a requirement for a Service Processor. If needed a 3745 Model 170 can be upgraded to a 3745 Model 17A at the customer's location.
- **Models A (17A, 21A, 31A, 41A and 61A):** These models provide hardware and programming support for the 3746 Expansion Unit Model 900 that greatly increases 3745 connectivity by offering ESCON support, high-performance Token-Ring adapters, and high-connectivity communication line adapters. When used with a 3746 Model 900, a Model 17A, 21A, 31A, 41A or 61A can become a powerful controller for user access to S/390 server applications. Model 17A is designed to control small-to-medium sized networks. Models 21A, 31A, 41A and 61A are general-purpose, channel- or link- attached communication controllers designed to control medium-to-large-size networks.

- The 3746 Model 900 represents a very high potential for network growth in terms of number of users, traffic rate between end users and applications and volume of data exchanged between enterprise server databases and distributed servers. And in many conditions, the expansion of networks via the 3746 Model 900 can provide a reduction of software cost incurred by the 3745. The 3746 Model 900 can be upgraded on site to a 3746 Model 950 Nways Multiprotocol Controller. See "IBM 3746 Nways Multiprotocol Controller Models 900 and 950" for more information.

At the heart of the 3745 is the Central Control Unit (CCU) with its associated main storage, channel adapters and line attachments (or line scanners and interface couplers). A Direct Memory Access (DMA) bus is used to transfer data between the 3745 main storage and the 3745 speed scanners, and also the 3746 Model 900 adapters, contributing to the inherent operational performance of the 3745.

The 3745 operates under the control of the Advanced Communications Function/Network Control Program (ACF/NCP), which resides in the CCU. ACF/NCP controls attached lines and terminals, performs error recovery and routes data through the network. NCP tier pricing provides graduated pricing so that NCP software license charges are proportional to the installed capacity of the 3745.

Several IBM programs are available to enhance network performance for the 3745 family. The IBM NTuneMON and IBM NTuneNCP programs have monitoring and tuning capabilities to deliver quick, dynamic network performance. The X.25 SNA Interconnection (XI) program provides the 3745 with a DCE interface for X.25 DTEs. The IBM X.25 NCP Packet Switching Interface (NPSI) program lets SNA users communicate over X.25 packet-switched data networks. For improved performance the 3745 can also be connected to a Frame Relay network.

All 3745s are supported by the IBM NetView/390 program, which provides improved and centralized network control, easier problem determination and higher productivity for your operations staff.

## Performance benefits

- High-end capacity and performance, with up to six times the power of the 3725, allows the consolidation of older 3705, 3720 and 3725 platforms and a reduced number of NCPs.
- Dual CCUs provide support for more line and terminal connectivity in a single platform and implementation of more network functions.
- Increased memory, with up to 16-MB main storage and up to 64 KB cache on each CCU, provides support for advanced applications and higher performance.
- High-speed line support via the direct memory access (DMA) bus provides direct data movement from the high-speed scanners to the 3745 memory without control program interruption, minimizing CCU usage and thus supporting significantly more high-speed lines.
- Application support provides the possibility to implement new functions such as APPN®, SNI and X.25 that may require significant memory or CPU capacity.
- The buffer chaining channel adapter (BCCA) allows much higher throughput when connecting to the S/390 server, improving channel performance by 25 to 100 percent depending on the traffic type.

### Availability benefits

- Dual CCUs provide new options for backup, recovery and high availability, so that you may not have to buy an additional 3745 to provide redundancy.
- Distributed architecture with independent subsystems provides significant availability enhancements compared to 3705, 3720 and 3725.
- Concurrent maintenance allows service personnel to work on failing components without disruption to normal box operation.
- Modular power subsystem distributes power throughout the 3745, providing redundancy so that power supply failures do not necessarily bring down the whole controller.
- Hot-pluggable LICs allow you to insert new LICs without powering down the controller.
- Port swapping of LICs and TICs allows a line or LAN port to be moved nondisruptively after a failure of a LIC, TIC or scanner. This allows you to replace a failing component or move to a backup port without changing the NCP definitions.
- Internal hard disk stores one or two NCP load modules so that network recovery is enhanced through automatic recovery and NCP reload after network failure.
- Remote Support Facility allows IBM service personnel to run diagnostics, examine error records or apply remote microcode fixes through a telecommunication line.
- Automatic scanner re-IML by the Service Processor after scanner failure and notification to NetView/390 ensures higher network availability.
- Fast re-IML after certain failure situations reduces the restart time.

- NetView Alert generation creates generic alerts with specific 3745 component information, assisting problem determination and reducing outages after failure.
- Automatic box event record analysis reduces problem determination time for complex problems and allows service personnel to determine the cause of failure quickly.

### Usability benefits

- Remote or unattended operations support uses built-in functions such as Remote Console Access and Remote Support Facility.
- Remote Console Access reduces costs to technical personnel at remote sites by allowing operator access from a remote network control center.
- CCU/NCP backup switching from console reduces the requirement for external switching equipment.
- Scheduled power-on allows the operator to set the power on time of the 3745 to a specific time of day, reducing environmental costs.
- Channel address changes are now set through the SP console without requiring service personnel to set hardware jumper switches.
- Scanner-LIC independence allows increased flexibility in adding or changing line capacity to support network changes.
- Direct-connect line speeds are set in the NCP, without requiring service personnel to make hardware modifications to the line speeds.
- NCP tier pricing provides graduated NCP pricing so that NCP software license charges are proportional to the installed capacity of the 3745.
- Low maintenance costs and one-year warranty reflect the 3745's superior reliability, serviceability and availability capabilities, thus reducing overall costs.

- Smaller size and floor space requirements compared to similar capacity 3725 and 3705 configurations provide reduced environmental costs.
- Renaming of NCP load module allows you to migrate load modules on the 3745 hard disk without having to reload the NCP to change the external name.

### Connectivity benefits

- New high-bandwidth connectivity options support T1 and E1 serial lines, 10-Mbps Ethernet and 16-Mbps Token Ring.
- Large number of medium-speed lines support up to 896 lines in a single controller.
- Frame Relay Frame Handler support allows you to build a private Frame Relay network to support multiprotocol applications.
- Frame Relay Termination Equipment support provides attachment to a public or private Frame Relay network.
- Selective scanning allows extra LICs to be added to the 3745 but not scanned until one of the lines is activated. This provides increased flexibility to handle production and backup scenarios and increases the number of low and medium scanners that can be attached to the 3745.
- A single scanner supports a wide range of performance from 50 to 256 Kbps.

# 3745 Communication Controller Specifications

These communication controllers are suitable for small to medium sized networks.

Model	CCU	Storage	Service processor
170	1	8	No
17A	1	8	Yes

These communication controllers are suitable for medium to large sized networks .

Model	CCU	Storage	Service processor
21A	1	4 or 8 MB	Yes
31A	1	4, 8 or 16 MB	Yes
41A	2	4 or 8 MB	Yes
61A	2	4, 8 or 16 MB	Yes

### Maximum configurations

	170/17A	21A	31A	41A	61A
CCU	1	1	1	2	2
Cache Memory (KB)	32	16	64	2 x 16	2 x 64
Main Storage (MB)	8	8	16	2 x 8	2 x 16
Parallel Channel Adapters	4	16	16	16	16
Low and medium speed	96	896	896	896	896
Lines (LIC1, 3, 4B)					
2-Mbps lines	4*	16**	16**	16**	16**
IBM Token-Ring 4/16 Mbps	2	8	8	8	8
Ports (IEEE 802.5)					
Ethernet Type V.2 LAN	4	16	16	16	16
Ports (IEEE 802.3)					

\*only 2 lines may be active at one time \*\*only 8 lines may be active at one time

### Line Interface Couplers (LICs) summary

	LIC1	LIC3	LIC4B
Number of lines	1-4	1	1
ITU-T	V.24; V.25 V.25 bis; X.21 bis	V.35	X.21
Maximum speed	19.2 Kbps	256 Kbps	256 Kbps
Link protocols	SDLC, BSC, X.25, Start/Stop Frame Relay*	SDLC, BSC, X.25 Frame Relay*	SDLC, X.25 Frame Relay*

\*Any protocol can be transparently transported between end stations over any LIC type, provided that the terminal equipment encapsulates the data in Frame Relay frames (I.233). NCP can natively route Internet Protocols over LIC1, LIC3 and LIC4.

### Ordering Information

	FC
Channel Adapter for Models 21A, 31A, 41A, and 61A	1561
Channel Adapter for Model 170/17A	1563
BCCA Channel for Models 21A, 31A, 41A and 61A	1571
BCCA Channel for Model 170/17A	1573
Low Speed Scanner for Models 21A, 31A, 41A, and 61A	4720
Low Speed Scanner for Model 170/17A	4721
High Speed Scanner for Models 21A, 31A, 41A, and 61A	4740
High Speed Scanner for Model 170/17A	4741

Token-Ring Adapter for Models 21A, 31A, 41A, and 61A	4770
Token-Ring Adapter for Model 170/17A	4771
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Ethernet Adapter for Models 21A, 31A, 41A, and 61A	4780
Ethernet Adapter for Model 170/17A	4781
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LIC Unit	4900
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Line Interface Coupler Type 1	4911
Line Interface Coupler Type 3	4931
Line Interface Coupler Type 4	4942

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### Feature conversions

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From	To
170	17A
210	21A
210	31A
210	41A
210	61A
310	31A
310	61A
410	41A
410	61A
610	61A
21A	31A
21A	41A
21A	61A
31A	61A
41A	61A

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## Key Customer Benefits

- Improved performance over 3720 and 3725
- High availability because of reliable technology, fault avoidance and improved serviceability
- Selected connectivity adapted to different user needs
- Allows for traffic growth, and network or machine consolidations
- Model and feature conversions and upgrades in the field
- Offers a variety of robust networking solutions in terms of connectivity, growth enablement, performance, functions, availability and system management
- Excellent choice for small to large networks
  - supports SNA, IP, and Frame Relay protocols
  - proven technology
  - NCP tier pricing enables you to pay for what you use
  - scalable with highest availability

## Supplementary Information

The following sales tools are available for the 3745:

- Information on the 3745 is available at:
  - [www.networking.ibm.com/netprod.html](http://www.networking.ibm.com/netprod.html)
  - [www.networking.ibm.com/375/375prod.html](http://www.networking.ibm.com/375/375prod.html)