

Migrating Legacy IBM 4700 Branch Systems To New Generation Platforms

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1. Scope

1.1. Introduction

Organizations with existing investments in IBM 4700 branch banking automation systems are limited by their legacy technology in providing new application services to satisfy evolving business objectives.

Although new channel development is a primary focus for many financial institutions, branch networks still provide a very personal and direct means of communicating and interacting with customers. The challenge is how to deliver new application services into branches based on legacy platforms and technologies.

NCI offers a solution portfolio that can facilitate a phased migration from legacy IBM 4700 to new PC/LAN architecture. The key outcomes of this migration strategy are:

- Selective protection of the existing investment in legacy applications and hardware.
- Introduction of open PC technology to support new application services.

1.2. Commercial track record

NCI has implemented a variety of 4700 connectivity and migration strategies at organizations worldwide, including:

- Bank of Montreal
- National City Corporation
- Laurentian Bank
- Toronto Dominion Bank
- Allied Irish Bank
- BWS
- GAD
- Sparbanken
- Skandinaviska Enskilda Banken
- Bank Austria
- Banco Rio
- Bancomer
- St George Bank
- China Trust Bank

1.3 More Information

More information on this subject can be found online at www.nci-inc.com.

2. IBM 4700 environment

2.1. IBM 4700 environment

The IBM 4700 environment is a proprietary branch automation system based on a controller-terminal/peripheral architecture. The heart of the network is the IBM 4700 controller, which is analogous to a branch server. It is the platform on which applications written in proprietary languages execute.

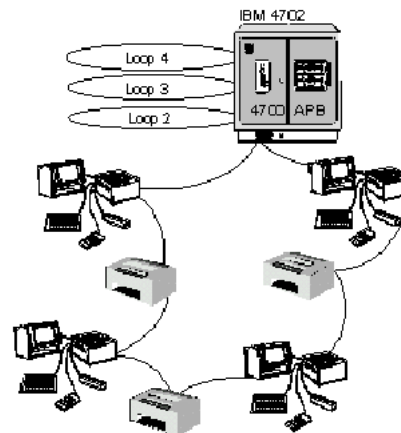
Business Rules are developed in two key languages/environments: 4700 Financial Control Language (FCL) and RM.

User presentation and navigation is performed via terminal display stations with attached keyboards (such as IBM 4704 display station). Other financial peripherals/devices may also be connected into the network.

The physical network consists of two forms of proprietary cabling:

- B Loop Coaxial (DCA)
- Coaxial (DCA)

A typical 4700 environment using B Loop cabling is illustrated below:



(Third-party terminals and peripherals that emulate native IBM 4700 devices also exist. One example is the EF315 range of devices supported by Fortronics).

2.2 Environmental limitations

The proprietary 4700 environment was developed by IBM and in its native form cannot interface with new PC-based technology platforms. It is also “old” technology and suffers from many operational limitations, such as memory constraints and performance barriers.

The 4700 controller can only execute FCL or RM applications, which are time consuming and costly to develop due to their proprietary nature. Experienced resources with operating system or application expertise are hard to find and potentially expensive to acquire.

4700 display stations only support a character-based interface so it is not possible to exploit the power of graphical user interfaces (GUI). Peripherals, such as magnetic stripe readers, printers and PIN pads, are also proprietary and can only work when deployed in 4700 networks.

3. IBM 4700 migration

3.1 Application

The vast majority of legacy 4700 applications provide branch teller banking functions. These “bread and butter” banking services are likely to continue going forward – even if they are redeveloped and delivered as part of an entirely new application platform.

Organizations typically elect to redevelop basic services and add new services that enhance *sales* and *customer relationship management*. However, this requires considerable investment to:

- Develop new applications
- Introduce PC servers
- Introduce PC workstations
- Introduce new financial devices
- Introduce infrastructure components

However, it is possible using NCI solutions to migrate legacy 4700 FCL applications to execute on new PC/LAN platforms and therefore to maintain or extend the investment that they represent. This means that new investment can be directed to developing new application services that are more likely to contribute to revenue growth.

The key to this strategy is in two parts:

- Introduce new PC servers in order to establish a platform to deliver new application services.
- Migrate the legacy application and execute it unchanged on the new PC server, thereby deferring its redevelopment and freeing up investment funds for “higher impact” expenditure.

The 4700 controller is the key barrier to new application deployment. Eliminating it and introducing a PC server paves the way forward to deploy new application services. Being able to execute the legacy application on the new PC server makes this strategy a viable alternative.

<p>NCI Wizard is a software emulation solution that allows 4700 FCL applications to execute unchanged on a PC server.</p>
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(Note: NCI recently announced services proposals to migrate RM4700 based applications, however this does require limited redevelopment of the RM4700 application).

3.2 Hardware

Retaining the legacy terminals and peripherals can enhance the benefits of application migration.

This is because every legacy hardware item that is retained is a deferral of the investment required to replace it. Like application migration, deferring hardware replacement frees up investment funds for “greater impact” expenditure.

Developing new platform sales and customer relationship management applications will arguably have a greater impact to revenue growth. Investment can be made on new application development and the necessary new hardware to accommodate their delivery.

PC workstations to accommodate the new applications can be progressively deployed in a phased manner. Eventually, all legacy hardware may be replaced but investment in new hardware can be spread over time. Sometimes, hardware retention supports specific business objectives – such as opening new branches.

The migrated application can be deployed on new PC servers with all legacy hardware retained. This allows new branches to be opened easily (because the legacy application is used with the legacy hardware), but ready to accommodate new application services because the PC server replaces the 4700 controller. This offers the lowest possible risk combined with future potential for delivering new services.

NCI XOVER PC adaptor cards install into a PC server and support re-attachment of legacy display stations and peripherals via their existing B Loop and/or coaxial cabling.

3.3 Case example¹

Laurentian Bank of Canada exploited the opportunity to introduce new platform sales applications while continuing to use both legacy teller applications and terminal/peripherals.

The bank estimates an immediate cost saving of some \$3 million in pursuing such an approach. The savings were enhanced as the bank was standardizing and upgrading technology platforms across its own network and two acquired institutions.

Laurentian used NCI solutions to help migrate from a 4700 controller environment to a PC/LAN environment. The bank integrated both teller and its new platform sales application on the same PC server.

The investment in 4700 terminals and peripherals and low-end PC work-stations was retained, while new investment funds were directed into the new PC server hardware and advanced functionality in the platform.

The NCI migration approach yielded significant cost savings, as well as support of a significant investment to upgrade all branches with new PC servers.

¹Taken from an article published in Bank Technology News, November, 1996.

“NCI’s migration path allowed us to defer a multi-million dollar investment on PCs on the teller line and a new PC-based application while we concentrated our investment on new branch servers, client/server networks and a really spectacular new platform sales application.

“Because we are able to recycle the old 4700-based dumb terminals and printers at the teller lines, we were able to put our money where it would create the most impact ... which is on the platform.”

**– Gerald Lacasse
Director of Development
Laurentian Bank of Canada**

4. Migration implementation

4.1 A tactical measure

Implementing a legacy migration can be considered a tactical measure to defer wholesale replacement of legacy applications and hardware. It allows migration to be performed in a controlled transition. This ensures low business and technical risk and allows phased investment.

4.2 Validation

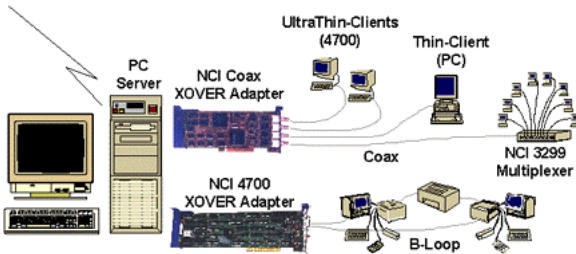
An analysis of the existing legacy environment is performed by NCI to validate the scope of any migration prior to implementation. A preliminary validation will be performed at no cost to qualify the environment for migration suitability.

4.3 Simple migration

The simplest migration is implemented by:

- a) Replacing the 4700 controller with a PC server;
- b) Running Wizard on the server to allow the 4700 FCL application to execute;
- c) Reattaching legacy display stations and peripherals via XOVER adaptor cards installed into the server.

This is illustrated below:



This represents the simplest form of migration because the only change to the network architecture is replacing the controller with a new PC server.

The diagram also demonstrates that PC workstations which may already exist, via either coax and/or B Loop connection, can also be migrated unchanged and remain connected to the legacy cabling. This offers total flexibility in terms of migration alternatives.

No new applications have been deployed and no new hardware introduced. It is the *least-risk* and *lowest cost* migration.

4.4 Introducing PC workstations

PC workstations can be introduced to accommodate delivery of both the migrated application and new applications.

These are connected to the PC server on the LAN using standard cables and network protocols (eg. ethernet, TCP/IP).

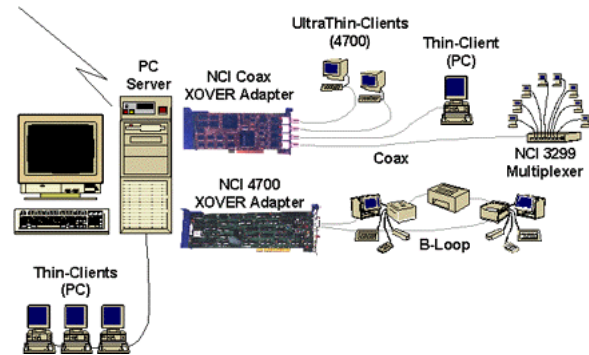
The migrated application executes within the Wizard emulation environment on the PC server in isolation from any other applications that might reside on the PC server. Presentation and navigation is supported on new PC workstations by a small application called a “thin client.”

The thin client provides character-based presentation and navigation on the PC workstation that emulates the legacy IBM 4700 display station. The PC workstation can also support any other applications or thin client presentation layers – such as a web-browser. The user simply “task-switches” between the two.

It is also possible to integrate financial devices that connect to the new PC workstations to support functions provided by the legacy application – printing, accepting PIN entries, etc., as well as any new applications.

PC workstations may operate simultaneously with any migrated hardware.

This is illustrated below:



Over time, PC workstations will replace the legacy hardware until migration is complete. At that point, the legacy application can continue to be used even though there is no more 4700 hardware within the network. It simply becomes another application that is delivered over the new technology platform.

5. Solutions

5.1 Description

The key NCI solutions that facilitate migration are:

1. **NCI Wizard** – a software solution that installs on a PC server running Windows NT or IBM OS/2 and allows 4700 FCL applications to execute unchanged on the server.
2. **NCI XOVER** – a PC adapter card that installs into a PC server and supports re-attachment of legacy display stations and peripherals via their existing B Loop and/or coaxial cabling. It comes in B Loop and coax forms. The B Loop card supports a single B Loop while the coax card supports four coaxial cables. NCI ClientServer-Mgr provides software integration for XOVER adapter cards.

3. **NCI ClientServer-Mgr** – a software LAN middleware solution that installs onto the PC server and all PC workstations; and provides underlying resource sharing and network transport for Wizard and XOVER, as well as any PC applications. It exposes an industry standard Application Programming Interface (API) called IBM Server Requestor Programming Interface to allow PC applications to manage shared resources. NCI ClientServer-Mgr is similar to IBM FBSS and IBM LANDP, but offers configuration and performance advantages.

Implementation services are also required to establish and validate the migrated environment. The current application scope influences the scope of investment in services.

4. **NCI ThinClient Text** – a software solution that installs on every PC workstation and provides a character-based presentation display of the migrated legacy application. It also manages all keyboard navigation for the legacy application.

A brief audit of the current environment and a confirmation of the migration scope will allow indicative pricing to be determined.

These solutions integrate to comprise a flexible and low-cost 4700 migration solution. NCI ClientServer-Mgr provides underlying resource management and can be used in its own right to manage resource sharing amongst PC applications on a LAN.

NCI has connectivity solutions that also facilitate connection of PC workstations to 4700 controllers.

5.2 Pricing

Software licence and adapter pricing depends on the type and number of legacy display stations and peripherals to be migrated and also how many PC workstations are to be introduced.



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