

Virtual Circuit
Switching:
Frame Relay

Virtual Circuit Switching

Global Addressing

Virtual Circuit Identifier

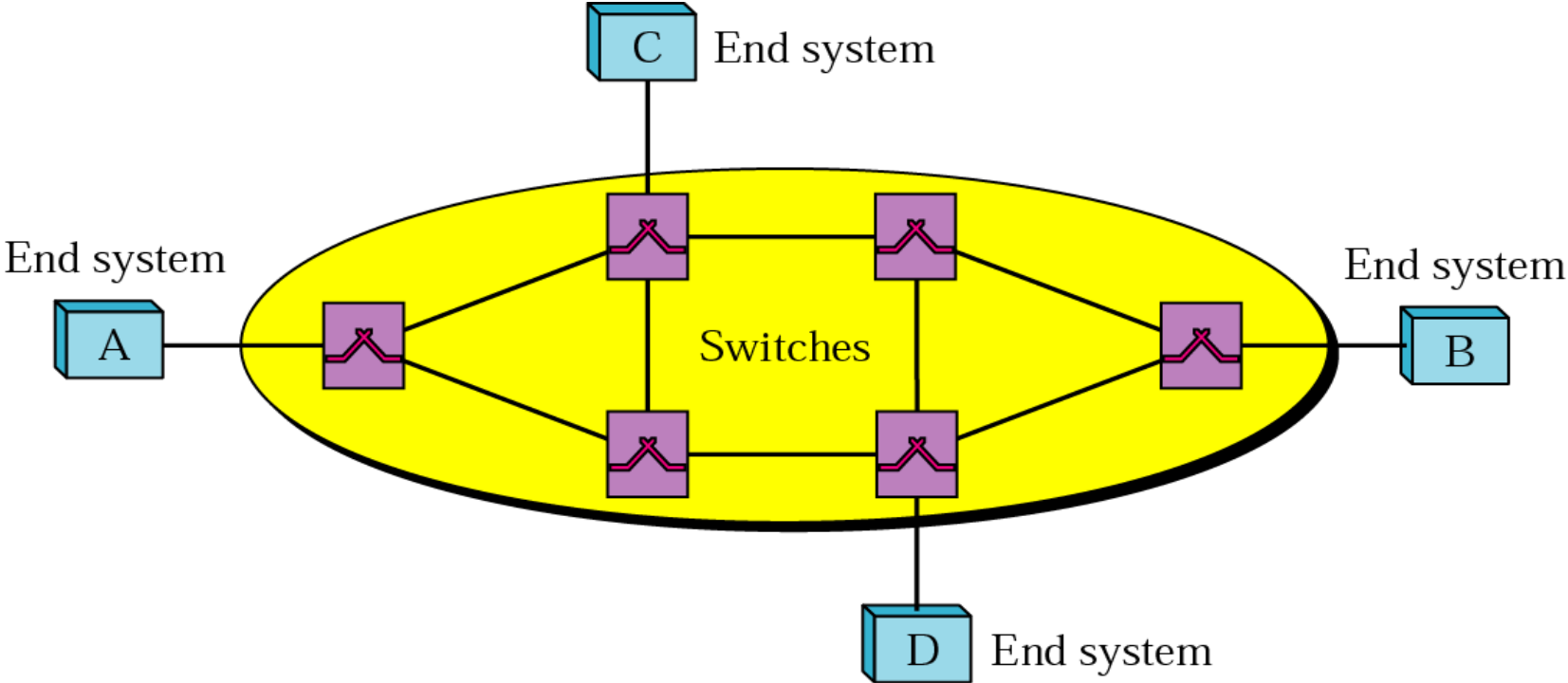
Three Phases

Data Transfer Phase

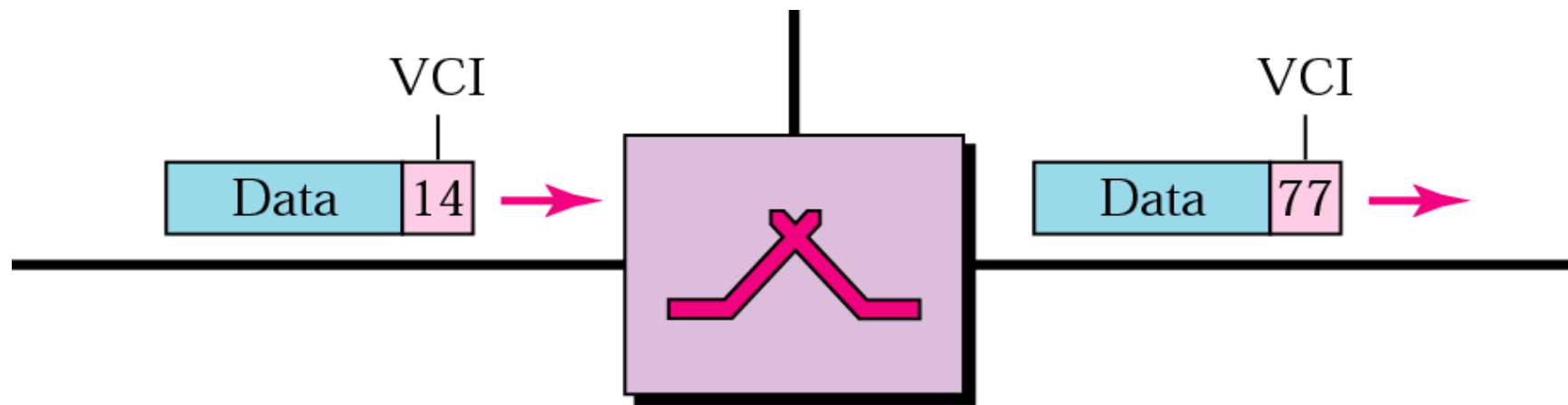
Setup Phase

Teardown Phase

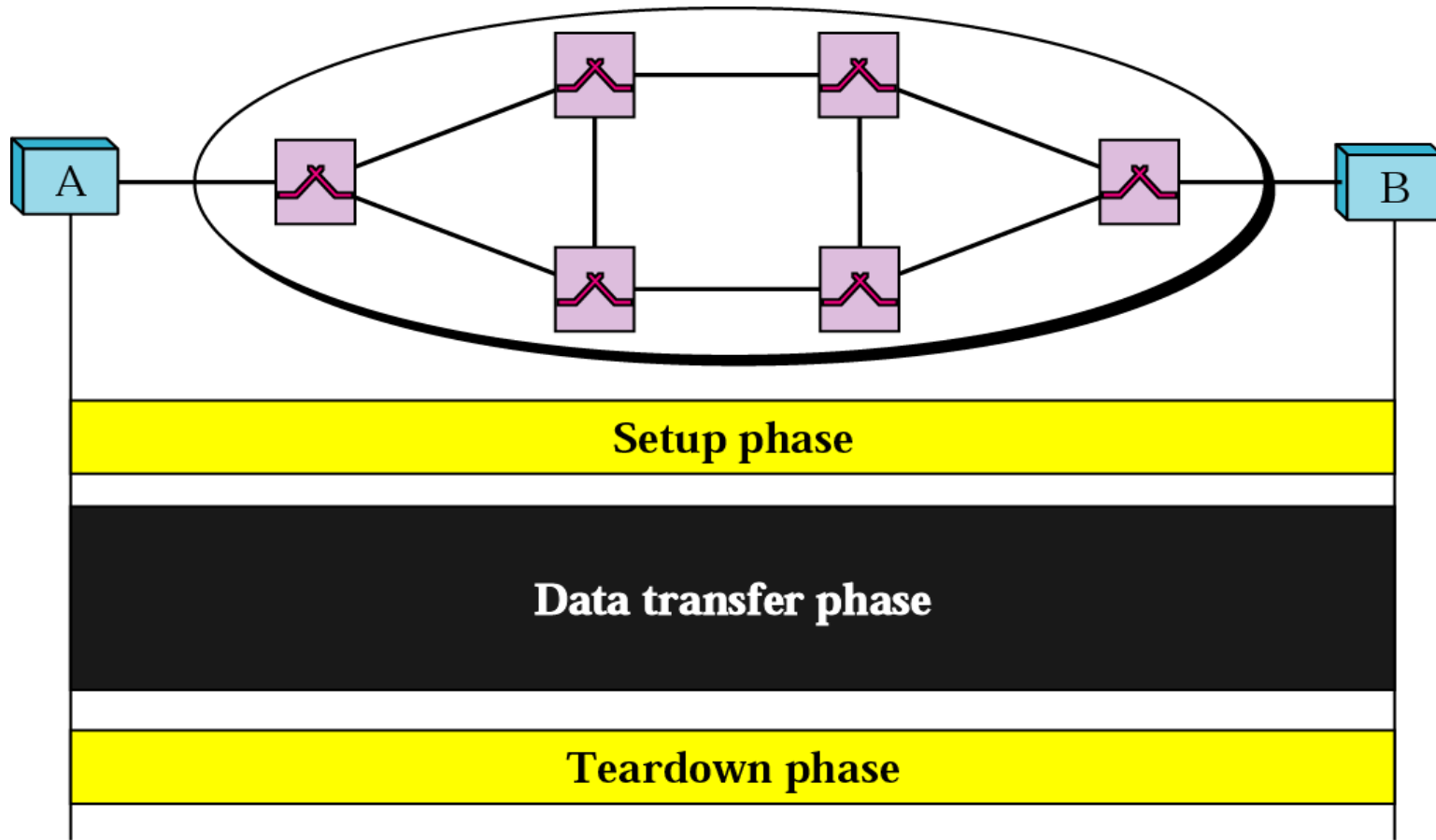
Virtual circuit wide area network



VCI - Virtual Circuit Identifier

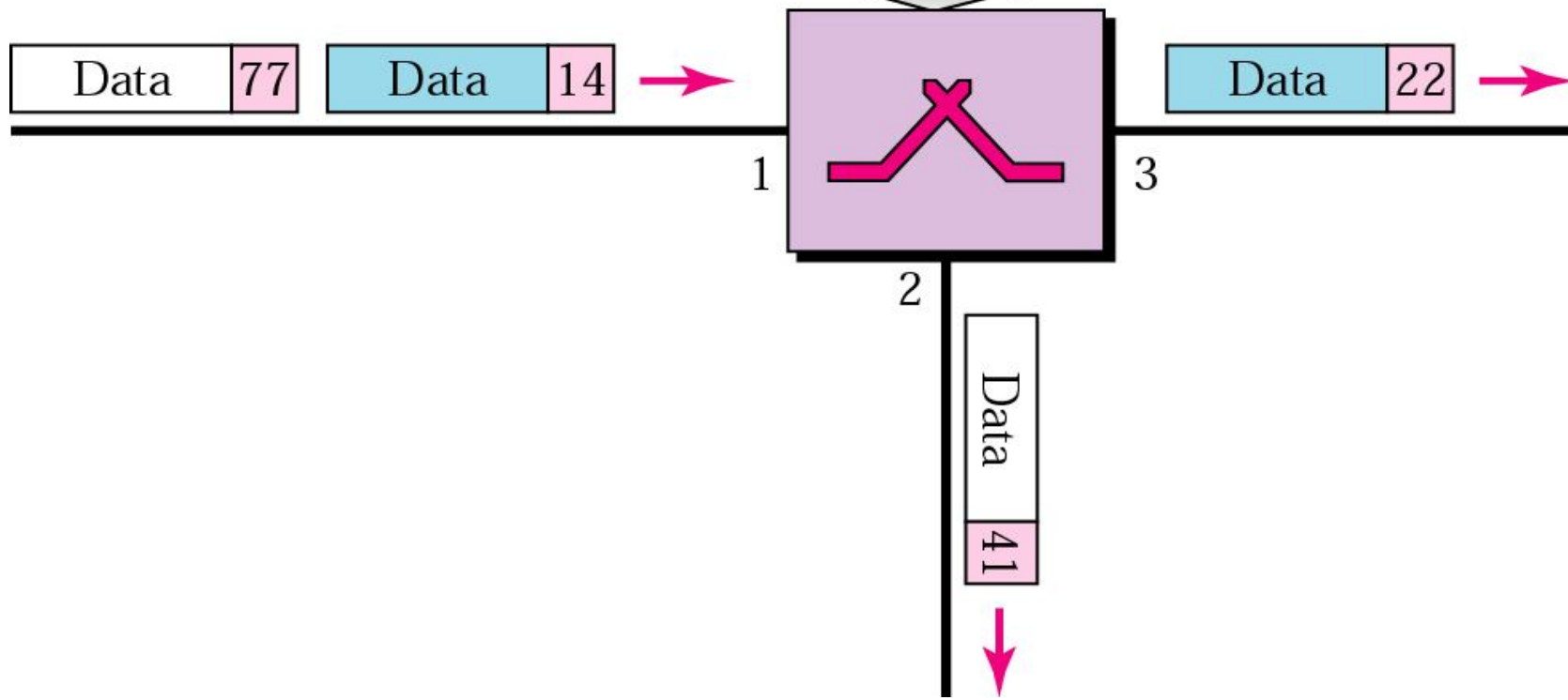


VCI phases

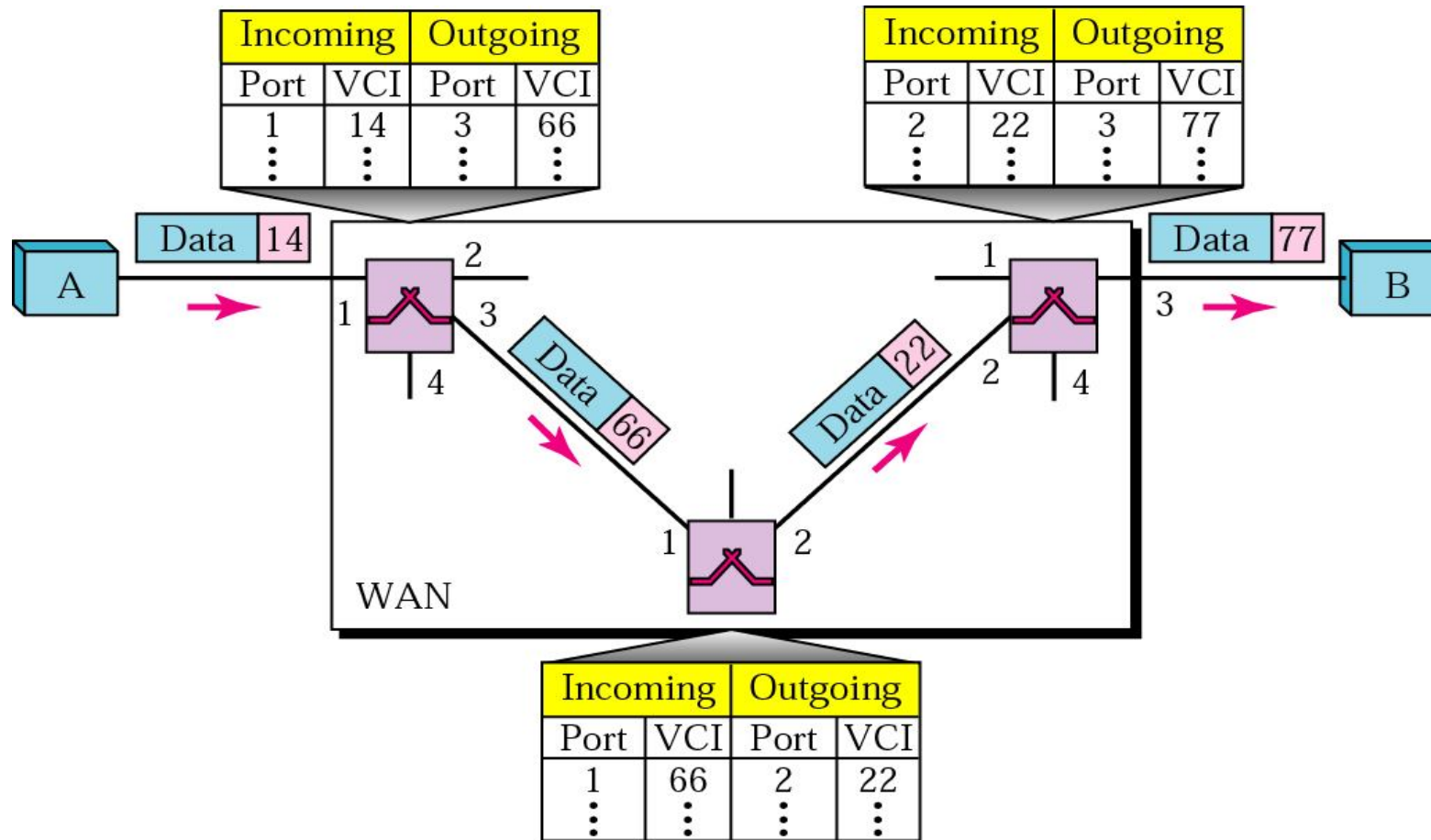


Switch and table

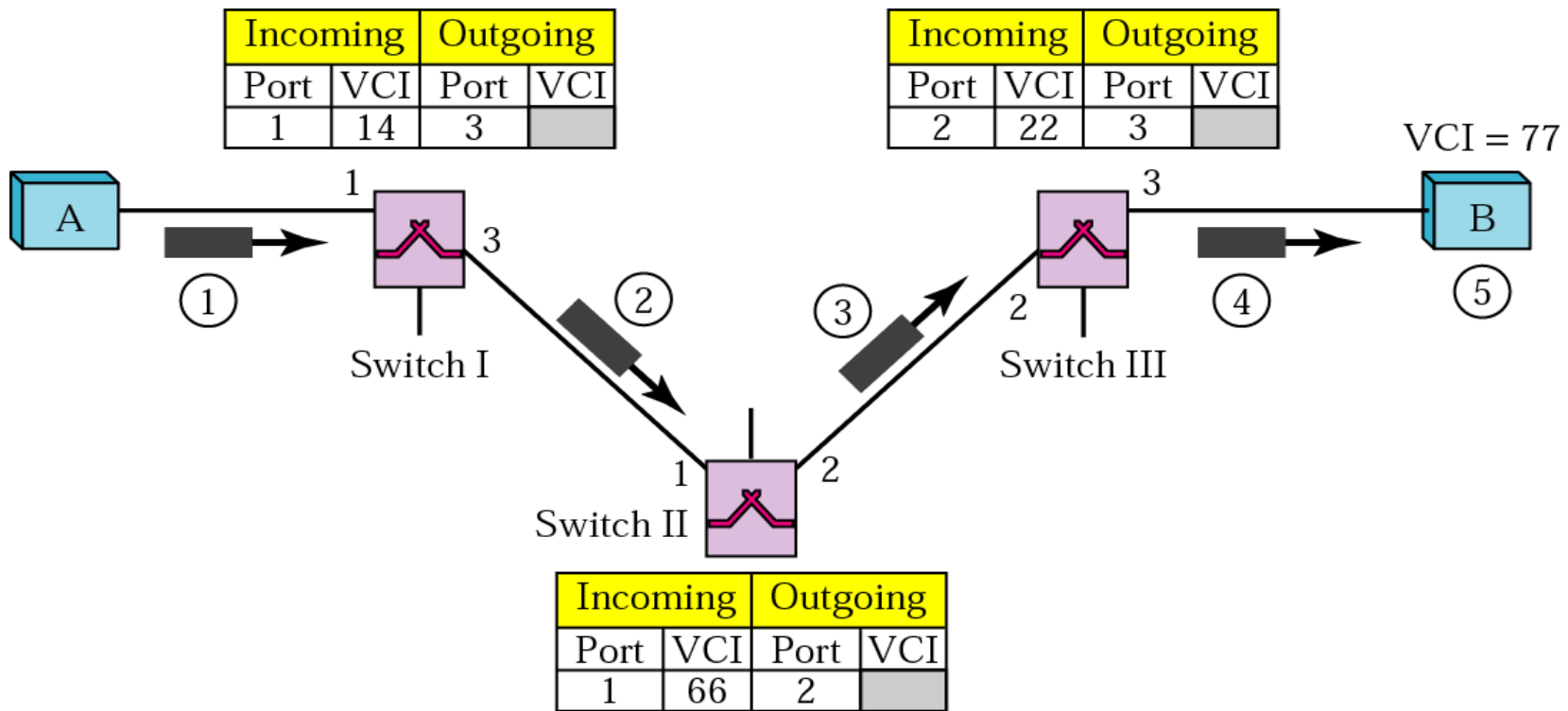
Incoming		Outgoing	
Port	VCI	Port	VCI
1	14	3	22
1	77	2	41



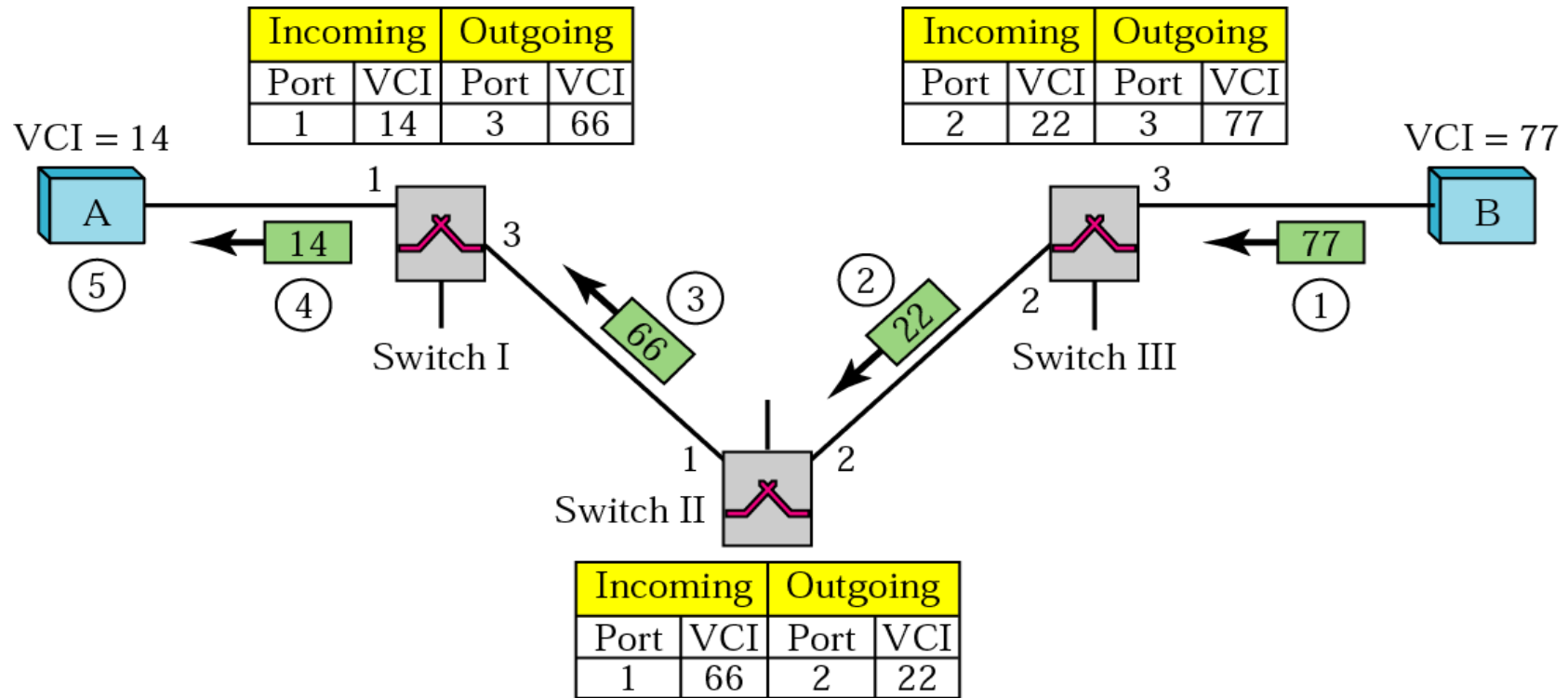
Source-to-destination data transfer



SVC (Switched Virtual Circuit) setup request



SVC setup acknowledgment



Frame Relay

Architecture

Frame Relay Layers

FRAD

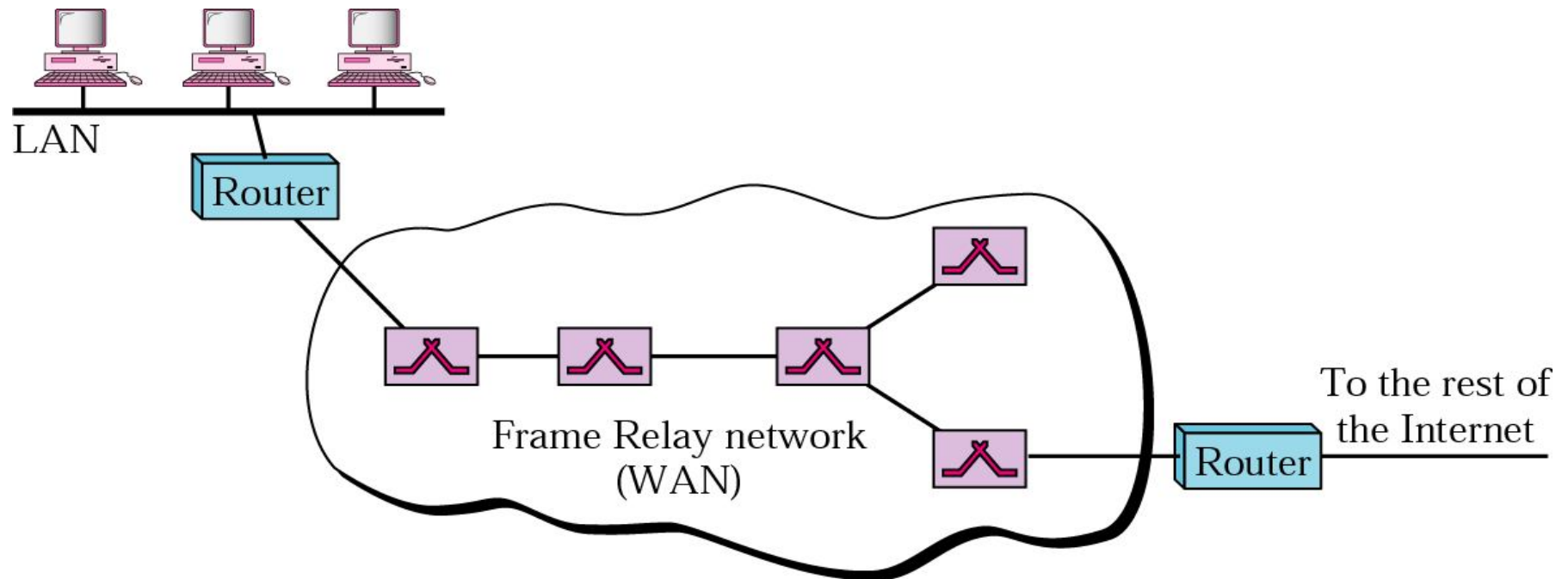
VOFR

LMI

Frame Relay network

VCI in Frame Relay are called DLCIs (Data Link Connection Identifier).

Frame Relay does not provide flow or error control; they must be provided by the upper-layer protocols.





Frame Relay layers

Frame Relay operates only at the physical and data link layers.

Data link

Simplified core functions
of data link layer

Physical

ANSI standards

Frame Relay frame

C/R: Command/response

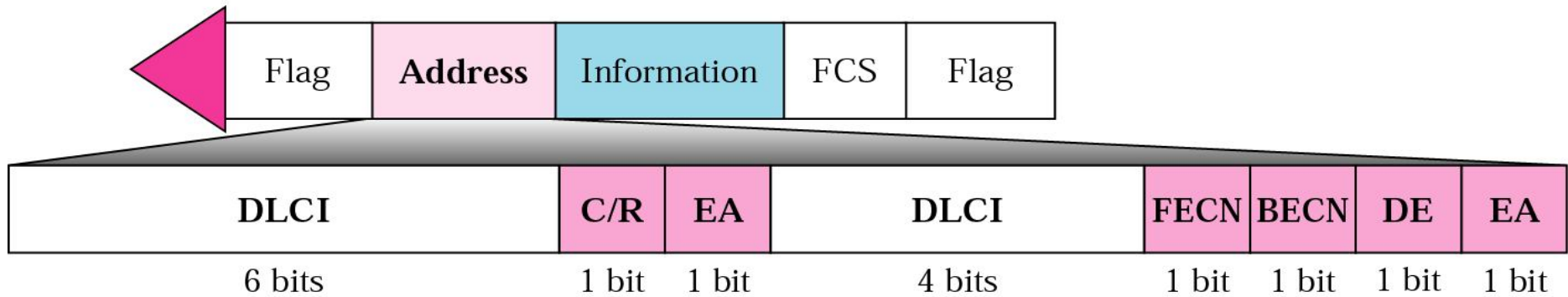
EA: Extended address

FECN: Forward explicit congestion notification

BECN: Backward explicit congestion notification

DE: Discard eligibility

DLCI: Data link connection identifier



Three address formats

DLCI			C/R	EA=0
DLCI	FECN	BECN	DE	EA=1

a. Two-byte address (10-bit DLCI)

DLCI			C/R	EA=0
DLCI	FECN	BECN	DE	EA=0
DLCI			0	EA=1

b. Three-byte address (16-bit DLCI)

DLCI			C/R	EA=0	
		FECN	BECN	DE	EA=0
DLCI				EA=0	
DLCI			0	EA=1	

c. Four-byte address (23-bit DLCI)

FRAD Frame Relay Assembler/Disassembler

