VTOA
Voice and Telephony Over ATM

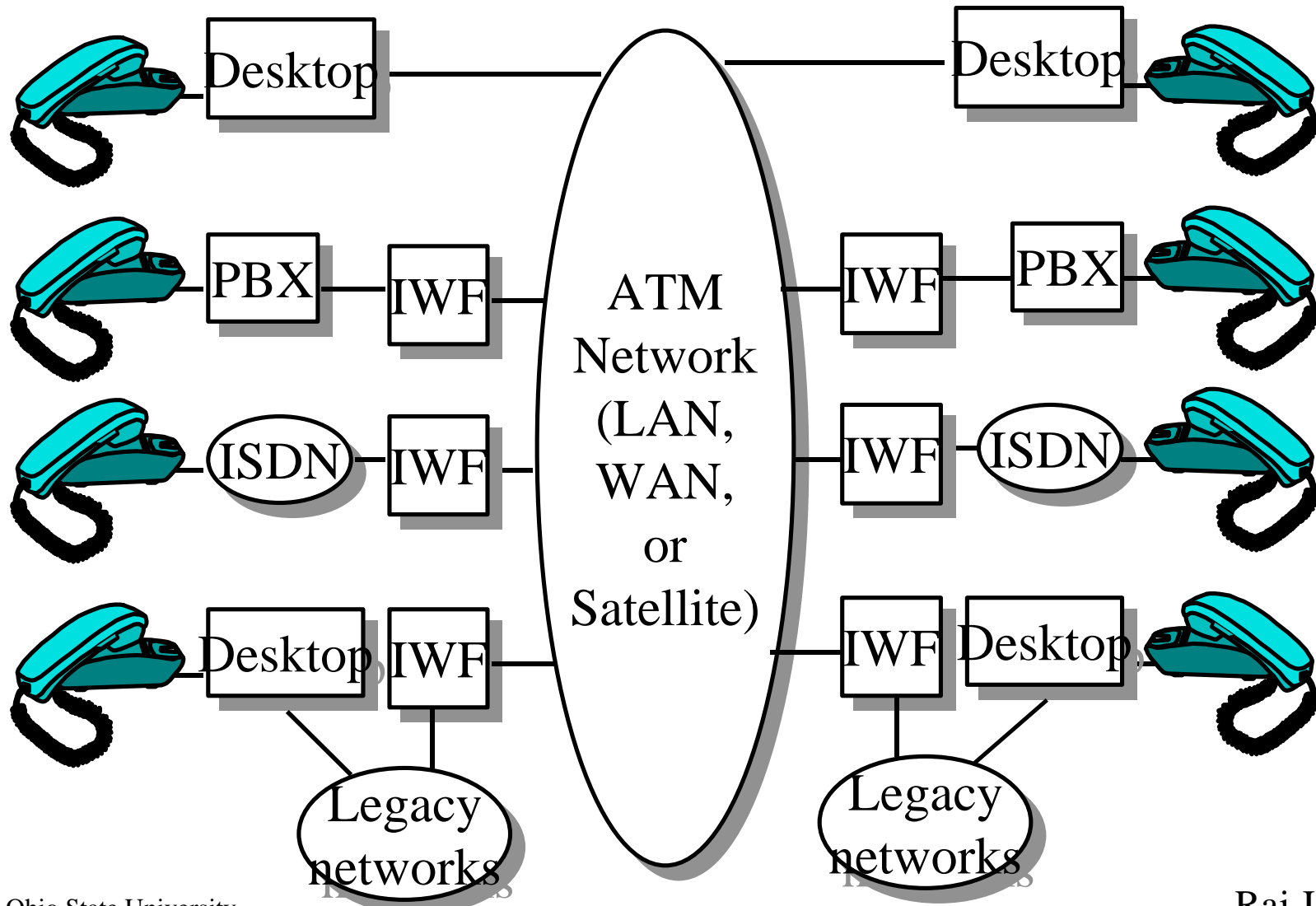Raj Jain

Professor of Computer and Information Science

Raj Jain is now at
Washington University in Saint Louis
Jain@cse.wustl.edu
http://www.cse.wustl.edu/~jain/

The Ohio State University

Raj Jain

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Overview

q Subgroups

q Status of Subgroups

q New AAL

VTOA

VTOA Subgroups

q ATM Trunking for Narrowband Services
  - q Phase 1 scheduled for completion soon
  - q Switched trunking for 64 kbps circuits
  - q Narrowband signaling interworking

q Voice and Telephony to the Desktop
  - q Phase 1 scheduled for completion soon
  - q Single 64 kb/s PCM voice to the desktop
  - q Interworking with ISDN and PBXs
  - q Basic supplementary services supported by UNI 4
  - q Compressed voice with silence removal in Phase 2

q Low bit rate voice

    q Work started in April 1996

    q A new AAL is being defined
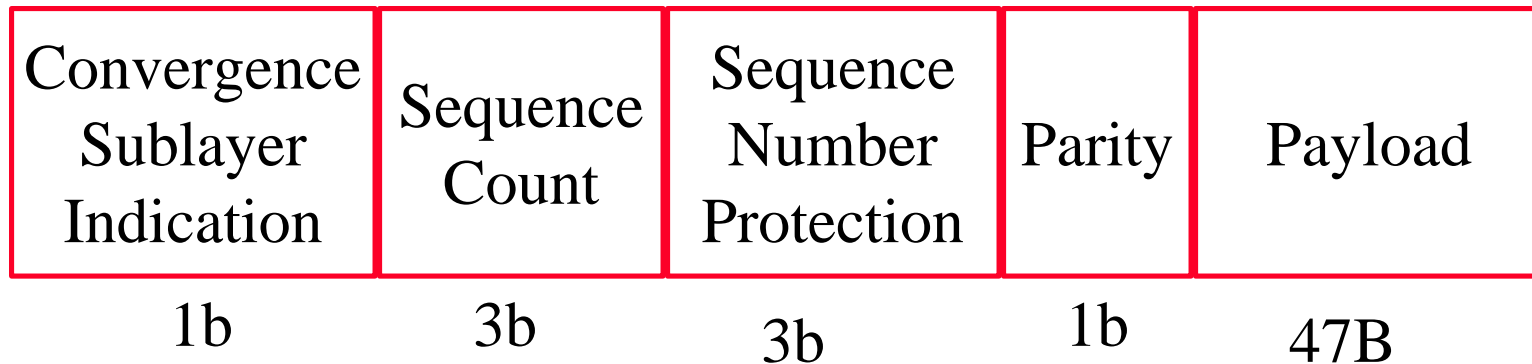
Why no voice?

q No standards.

q Cheaper alternatives available.

q No appropriate AAL.
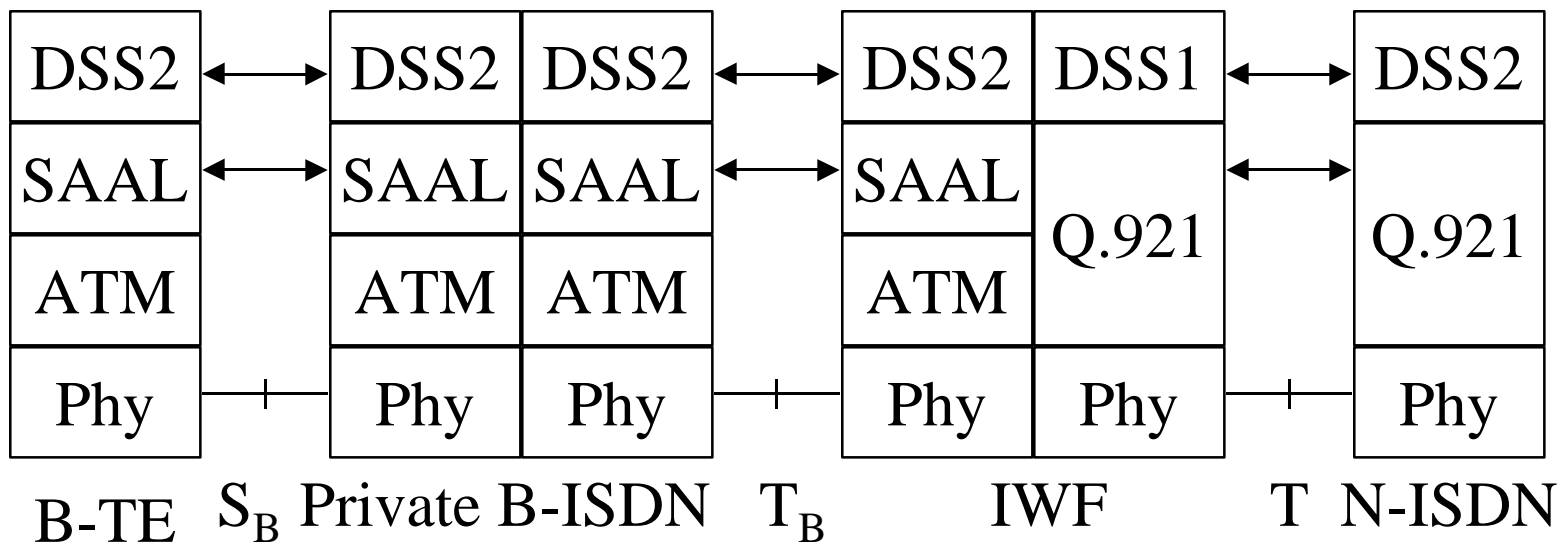
Current Desktop Standard

q   Uses AAL1: 47 bytes of payload

q   No forward error correction

q   No partial fill

q   Does detect cell loss

← Sequence Number →

Convergence Sublayer Indication	Sequence Count	Sequence Number Protection	Parity	Payload
1b	3b	3b	1b	47B

q Signaling interworking between N-ISDN and B-ISDN resolved

q For example, N-ISDN call clearing sequence is Disconnect/Release/Release complete

q B-ISDN sequence is Release/Release complete.

DSS2	←→	DSS2	DSS2	←→	DSS2	DSS1	←→	DSS2
SAAL	←→	SAAL	SAAL	←→	SAAL	Q.921	←→	Q.921
ATM		ATM	ATM		ATM			
Phy		Phy	Phy		Phy	Phy		Phy

B-TE   S_B   Private B-ISDN   T_B   IWF   T N-ISDN

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B-ISDN Supplementary Services

q   Provided by UNI 4.0

q   Direct Dialing In (DDI)

q   Multiple Subscriber Number (MSN)

q   Calling Line Identification Presentation (CLIP)

q   Calling Line Identification Restriction (CLIR)

q   Connected Line Identification Presentation (COLP)

q   Connected Line Identification Restriction (COLR)

q   Subaddressing (SUB)

ATM Trunking for Narrowband Services

q   Uses a signaling VC and a voiceband data VC

q   Data VC used to carry one or many 64 kb/s CBR channels

  q   One 64 kb/s channel with unstructured data transfer mode of AAL1

  q   A fixed number of 64 kb/s channels with structured data transfer mode of AAL1

  q   A variable number of 64 kb/s channels with dynamic SDT extension of AAL1

Structured Data Transfer (SDT)

q Structured = Framed as in SONET/SDH or PDH

q To carry such protocols in ATM, an pointer is needed to indicate beginning of frame in the cell

q Not all cells need to have this pointer

q CSI = 1 indicates the presence of the pointer

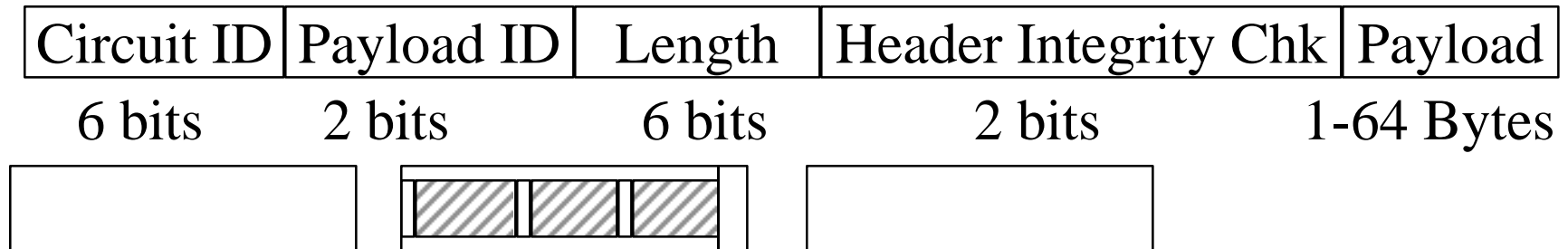| CSI=1	SN	SNP	Pointer			
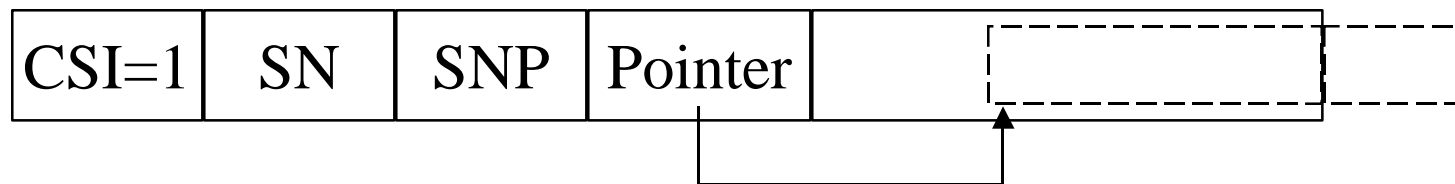
Delay

q 48 bytes at 64 kbps = 6 ms $\Rightarrow$ Need Echo cancelers

q 48 bytes at 16 kbps = 24 ms $\Rightarrow$ too long

q Can't fill a cell completely

q Current AALs allow segmentation
(long packets to multiple cells).

q Do not allow blocking (short packets in one cell)
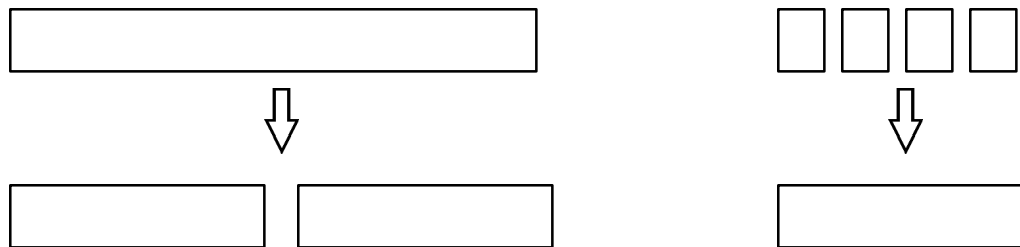
Key Requirements for New AAL

q   Allow transfer of short variable length packets

q   Allow packets with variable inter-arrival times

q   Allow packets to cross ATM cell boundaries

q   Allow for partially filled cells

q   Resynchronize under loss or errors

q   Allow multiple connections to be multiplexed on one VC

q   Allow clock recovery

q   Allow inband signaling

New AAL

| Circuit ID	Payload ID	Length	Header Integrity Chk	Payload
6 bits	2 bits	6 bits	2 bits	1-64 Bytes

q   AAL-CU (T1S1): 2 octet packet header + 2 octet AAL trailer
    CU stands for Composite Users (ITU SG 13 terminology)

  q   Payload ID: $0 \Rightarrow$ user data, $1 \Rightarrow$ OAM, $2,3 \Rightarrow$ Reserved

  q   4 octets of overhead for one voice channel per VC

  q   Includes 10 bits for FEC

q   Several Variations of AAL-CU: Only packet header. No AAL
    PDU trailer.

  q   No error correction

q   AAL5 with SSCS allowing blocking

New AAL Applications

q   Compressed wireless telephony

q   Wireless data

q   Compressed wireline telephony

Summary
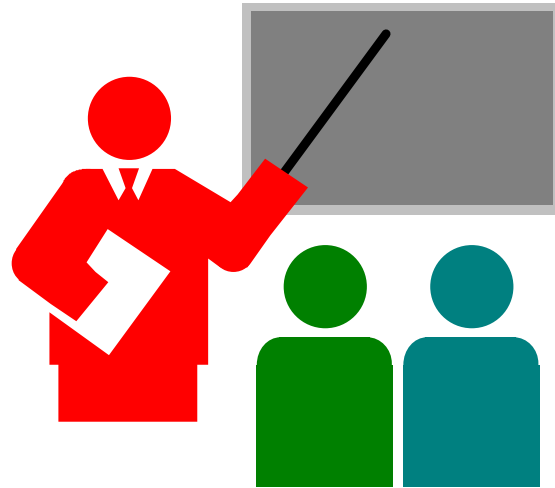
q Three activities: VTOA to Desktop, ATM Trunking of narrowband, and Low bit rate voice

q VTOA over Desktop and ATM Trunking group are using AAL1

q Low bit rate voice is planning a new AAL

References: VTOA

q "Voice and Telephony over ATM to the Desktop Specification" Version 0.0, ATMF/95-0917R5, June 1996.

q M. Duault, "Baseline text for voice and telephony over ATM -ATM Trunking for Narrowband Services," ATMF/95-0446R6, April 1996.

q J. Hopkins, "Comparison of AAL-CU Protocols," ATMF/96-0846, June 1996

q T1S1-5/95.001.Revision 1, "Short Multiplexed AAL (SMAAL) - An AAL for transporting short multiplexed Packets Baseline Document."

- q ITU SG 13 Q6.D.900 - July 95, "AAL for short packets multiplexed AALx"
- q See also, ATMF 96-0460, 96-0166, 96-429, 96-611, 96-441.