

VTOA

Voice and Telephony Over ATM

Raj Jain

Professor of Computer and Information Science

The Ohio State University

Columbus, OH 43210

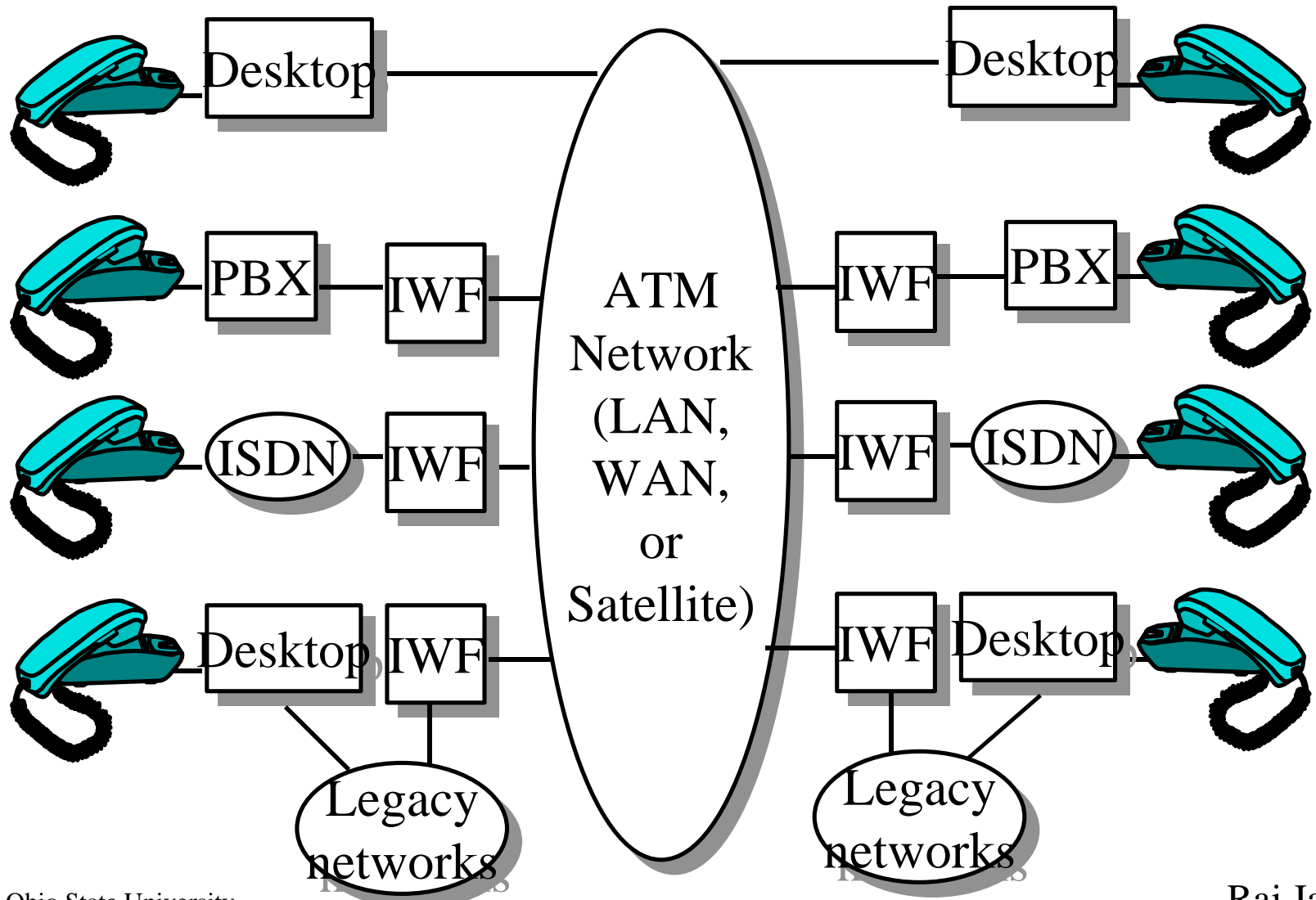
Jain@CIS.Ohio-State.Edu

<http://www.cis.ohio-state.edu/~jain/>



- 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

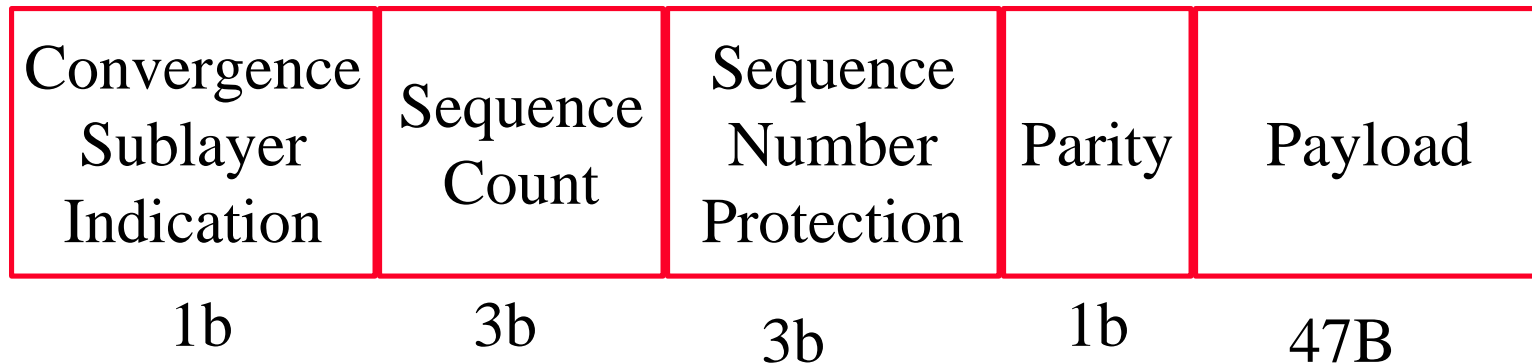
Why no voice?

- q No standards.
- q Cheaper alternatives available.
- q No appropriate AAL.

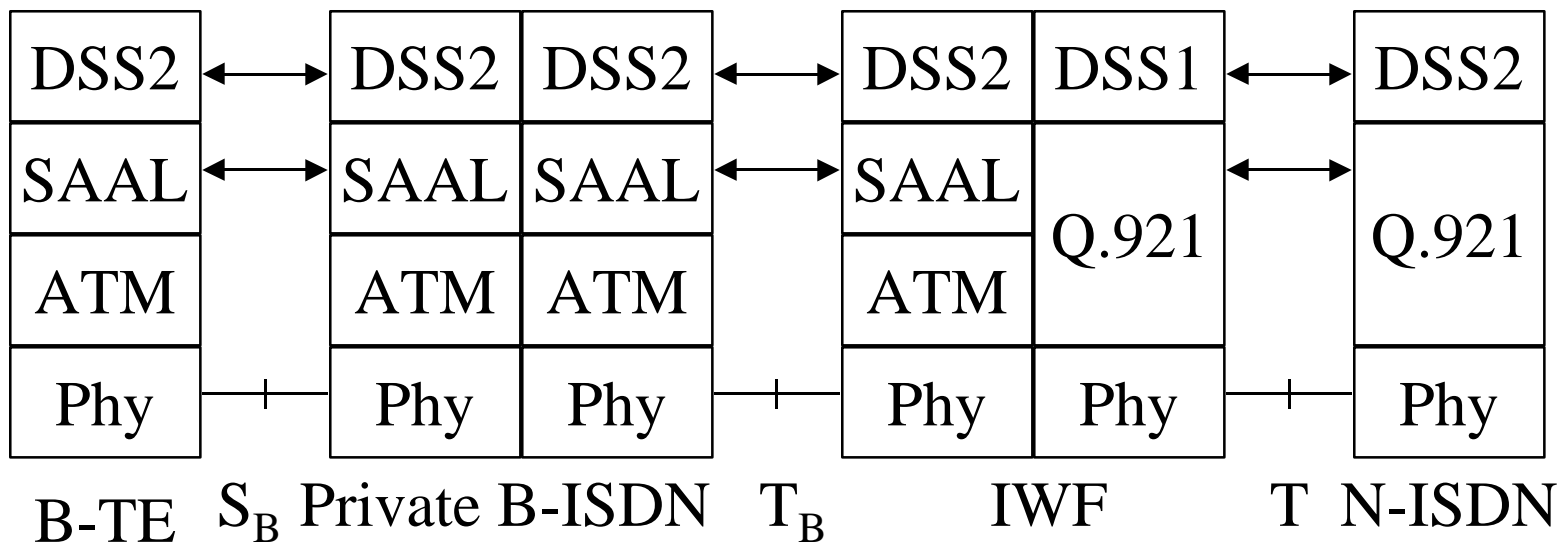
Current Desktop Standard

- q Uses AAL1: 47 bytes of payload
- q No forward error correction
- q No partial fill
- q Does detect cell loss

| ← Sequence Number → |



- 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.



B-ISDN Supplementary Services

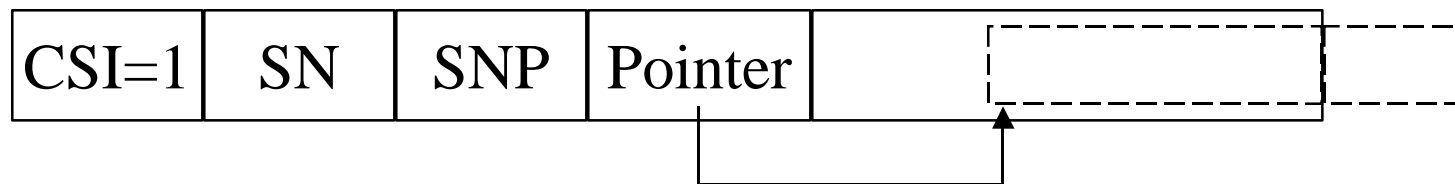
- q Provided by UNI 4.0
- q Direct Dialing In (DDI)
- q Multiple Subscriber Number (MSN)
- q Calling Line Identification Presentation (CLIP)
- q Calling Line Identification Restriction (CLIR)
- q Connected Line Identification Presentation (COLP)
- q Connected Line Identification Restriction (COLR)
- 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

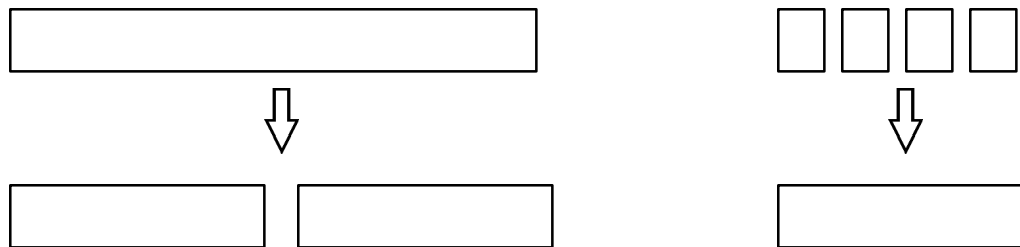
Structured Data Transfer (SDT)

- 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



Delay

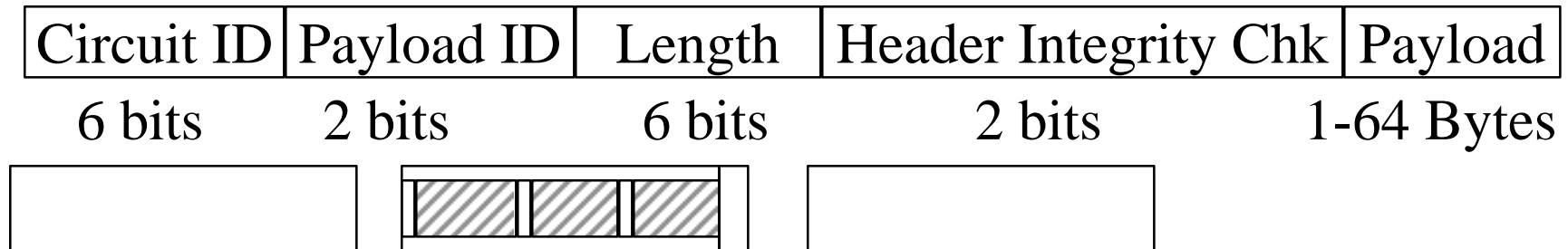
- q 48 bytes at 64 kbps = 6 ms \Rightarrow Need Echo cancelers
- q 48 bytes at 16 kbps = 24 ms \Rightarrow too long
- q Can't fill a cell completely
- q Current AALs allow segmentation (long packets to multiple cells).
- q Do not allow blocking (short packets in one cell)



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

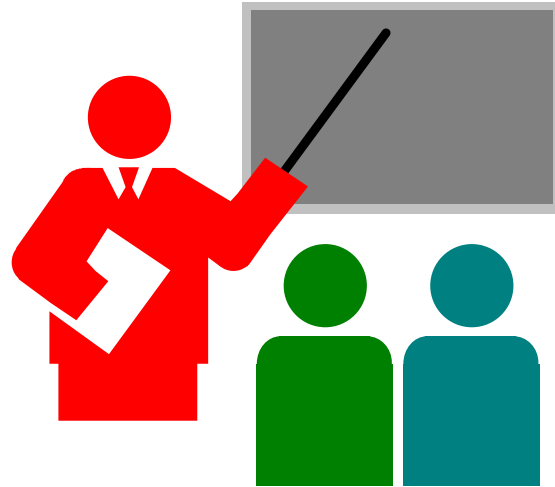


- q AAL-CU (T1S1): 2 octet packet header + 2 octet AAL trailer
CU stands for Composite Users (ITU SG 13 terminology)
 - q Payload ID: 0 \Rightarrow user data, 1 \Rightarrow OAM, 2,3 \Rightarrow Reserved
 - q 4 octets of overhead for one voice channel per VC
 - q Includes 10 bits for FEC
- q Several Variations 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.