ITU-T

International Telecommunication Union
International Multimedia Telecommunications Consortium

H.324 Call Setup Acceleration: An introduction to MONA

Ralph Neff

neff@pv.com

Senior Member of Technical Staff

PacketVideo

Joint ITU-T Workshop and IMTC Forum 2006 "H.323, SIP: is H.325 next?"
San Diego, 9-11 May 2006

ITU-T

Introduction

- Problem statement

  (Why do H.324 calls need accelerating, anyway?)
- Brief history
- Introduction to MONA
  - Techniques supported by MONA terminals
  - MONA-to-MONA calls
  - MONA-to-legacy calls
  - Performance
- Remaining work

ITU-T

Problem Statement: Why do we need call acceleration?

- Motivation comes from 3G world (3g-324m)
- A 3G video call can take a long time…
  - ~8 seconds to set up bearer (pre-ringing)
  - Ringing and answering time
  - 4 to 6 seconds for "call setup" (H.324) ← focus
    - Setting up Multiplex Level (H.223)
    - Exchange Caps, Configure Mux, Open A/V Channels (H.245)
    - Send / Receive / Render initial Audio & Video

Note: Caller and Callee experiences are quite different!

ITU-T

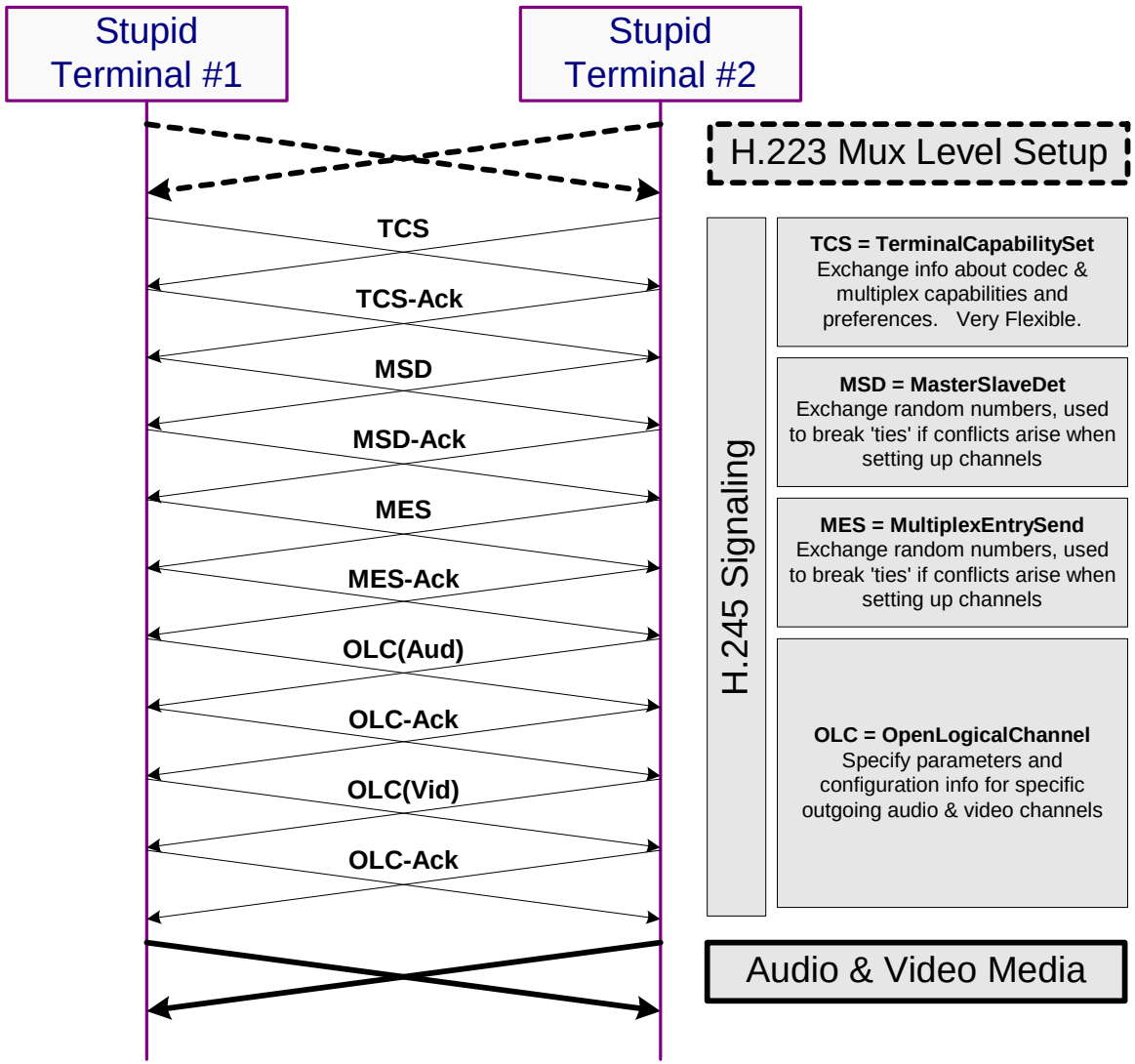
Statement of Goal

IMTC

Reduce "call setup" time to <1 second

Status Quo:
How are calls set up currently?

ITU-T

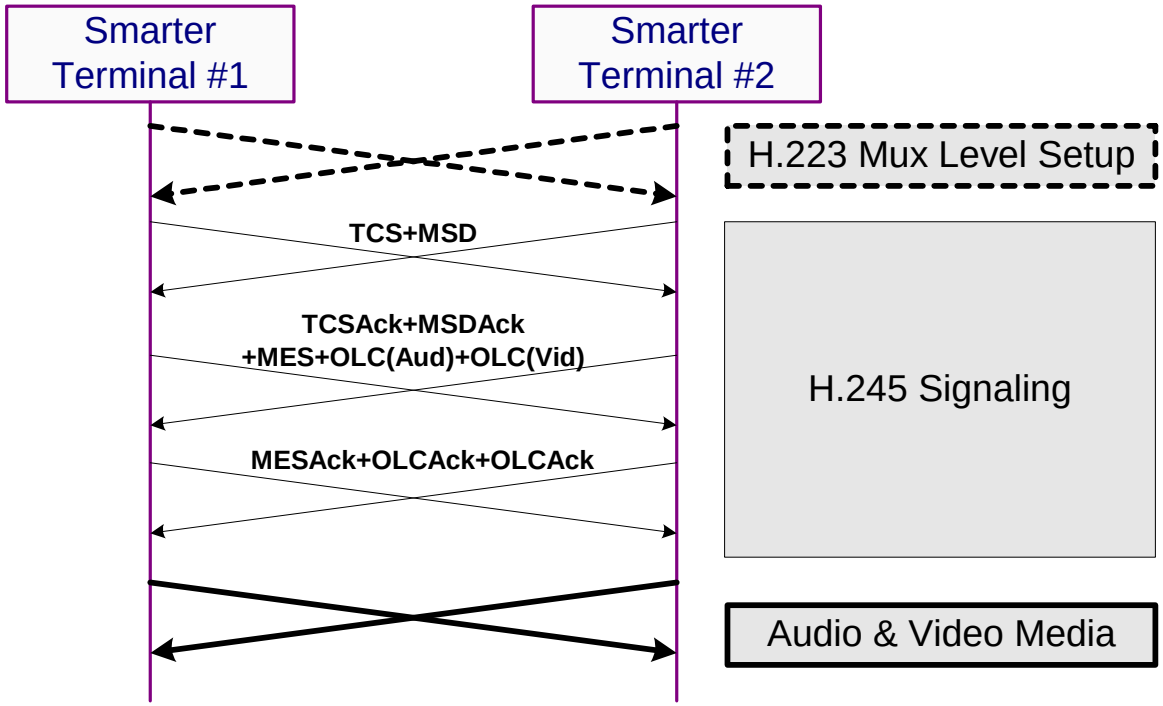


Status Quo:
How are calls set up currently?

ITU-T

IMTC

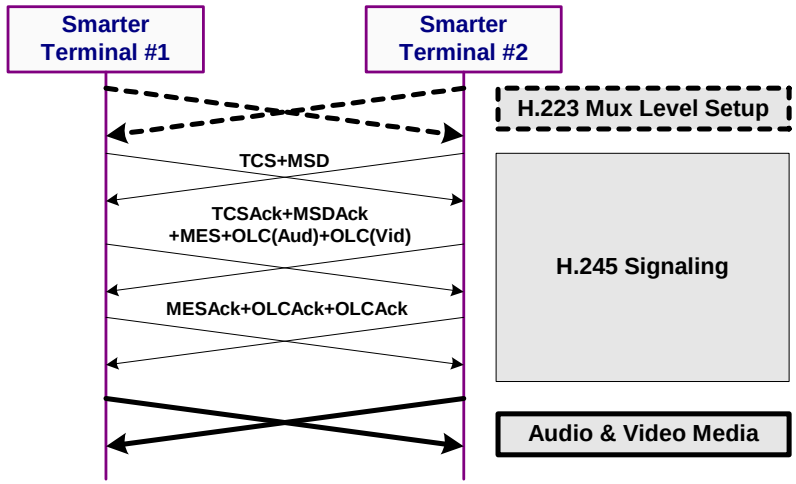
This is better…



Independent H.245 messages may be grouped

Status Quo:
How are calls set up currently?

ITU-T



Message grouping helps, however:

- Not all terminals do efficient message grouping
- NSRP responses (lower level acks) not shown
- Channel errors can lengthen the call setup
- Conflicts and Bi-directional OLC can also delay it
- Other things take time (e.g. set up camera, display, and codecs)

4-6 sec observed setup time

Brief History of Call Acceleration Topic in Standards

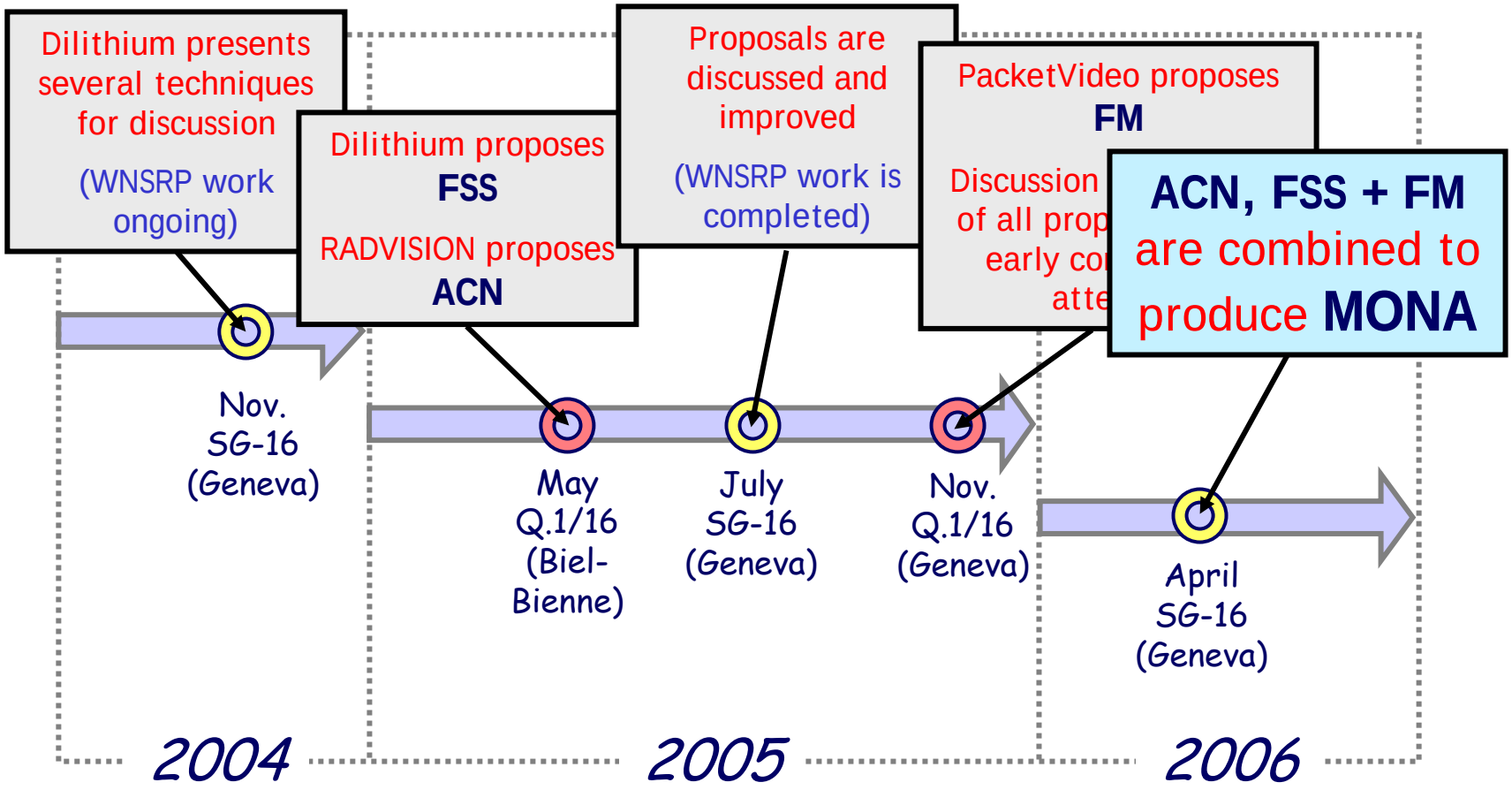
ITU-T

- Main work in ITU-T SG-16 Question 1
  - November 2004 to present – about 18 months
- Additional discussion and support from
  - **3GPP SA4** (related work item for Rel-7)
  - **IMTC 3G-324m Activity Group** (testing support)

Brief History of Call Acceleration Topic in Standards

ITU-T

- Main work in ITU-T SG-16 Question 1



The MONA acronym

Media-Oriented Negotiation Acceleration

Contributing Technologies (The MONA "Family Tree")

ITU-T

IMTC

- Media Preconfigured Channels **(MPC)**
  - Small table of commonly used codec + mux configurations
  - Early-bearer may be used to send media
- Signaling Preconfigured Channel **(SPC)**
  - Early-bearer exchange of capabilities/prefs + inference model
  - Preserves full flexibility of H.245 channel establishment
- Accelerated H.245 Procedures **(A2P)**
  - Media can be sent without waiting for OLC and MES exchanges
  - Implemented as minor changes to existing H.245 procedures

FM

FSS

ACN

Mapping to earlier proposals

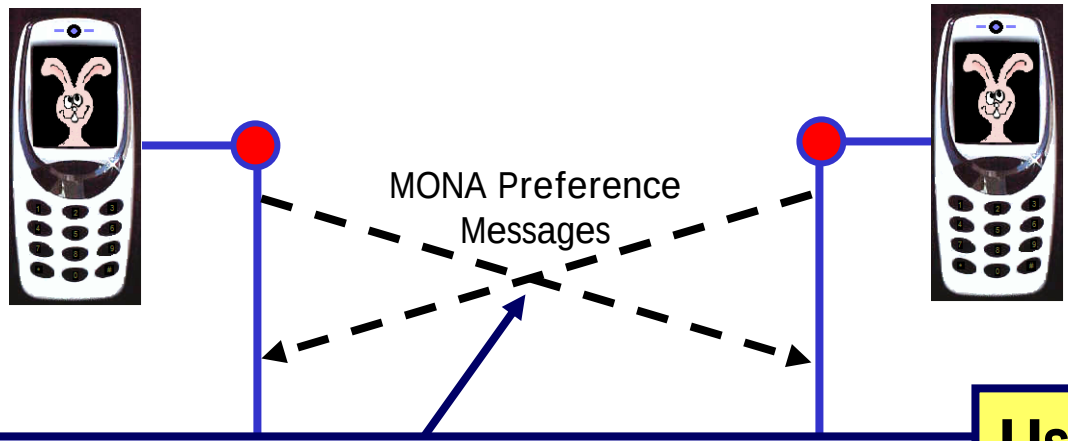
ITU-T

What can MONA terminals do?

- Exchange 'fast call setup' capabilities and preferences ("MONA Preference" Messages)
- Quickly set up audio and visual channels
  - **'Media Preconfigured Channels (MPC)'** may be used to set up A+V sessions with typical codecs and configurations
  - The **'Signaling Preconfigured Channel (SPC)'** may be used to negotiate any session type with full flexibility
  - **'Accelerated H.245 Signaling (A2P)'** is always supported as a low complexity fallback negotiation
- Maintain full compatibility with legacy terminals (using 'regular' H.245 – not accelerated)

How it works: MONA meets MONA

ITU-T



Preference Messages: information about session setup capabilities and preferences

- Do I support SPC?
- Which if any MPC's do I support (rx + tx)
- Do I prefer SPC or MPC?
- Other fields (Version, Mux Level, ACK)

Used to reach a common decision:

Setup using SPC

OR

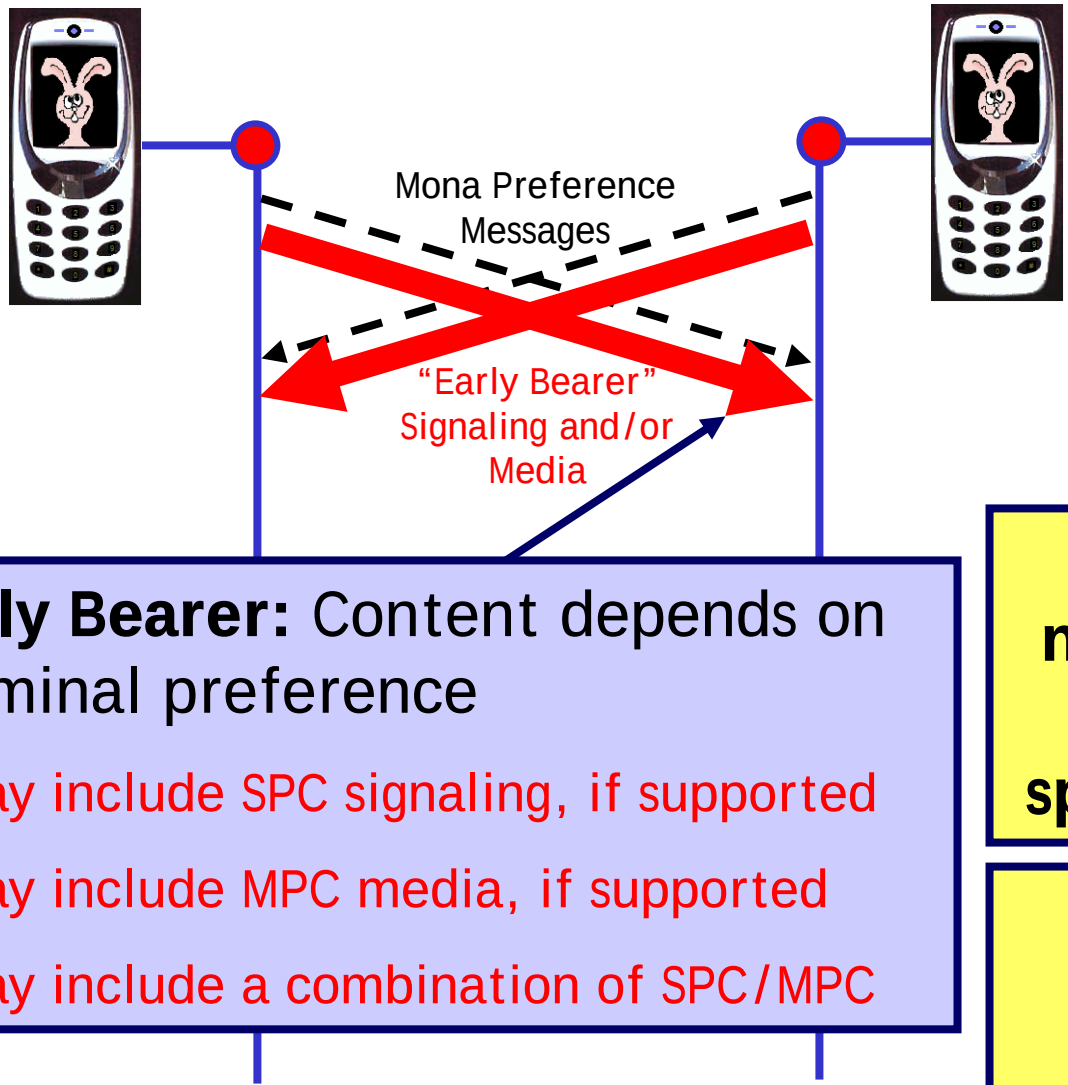
Setup using MPC (with A2P allowed for fallback)

OR

Setup using A2P

How it works: MONA meets MONA

ITU-T



Early Bearer: Content depends on terminal preference

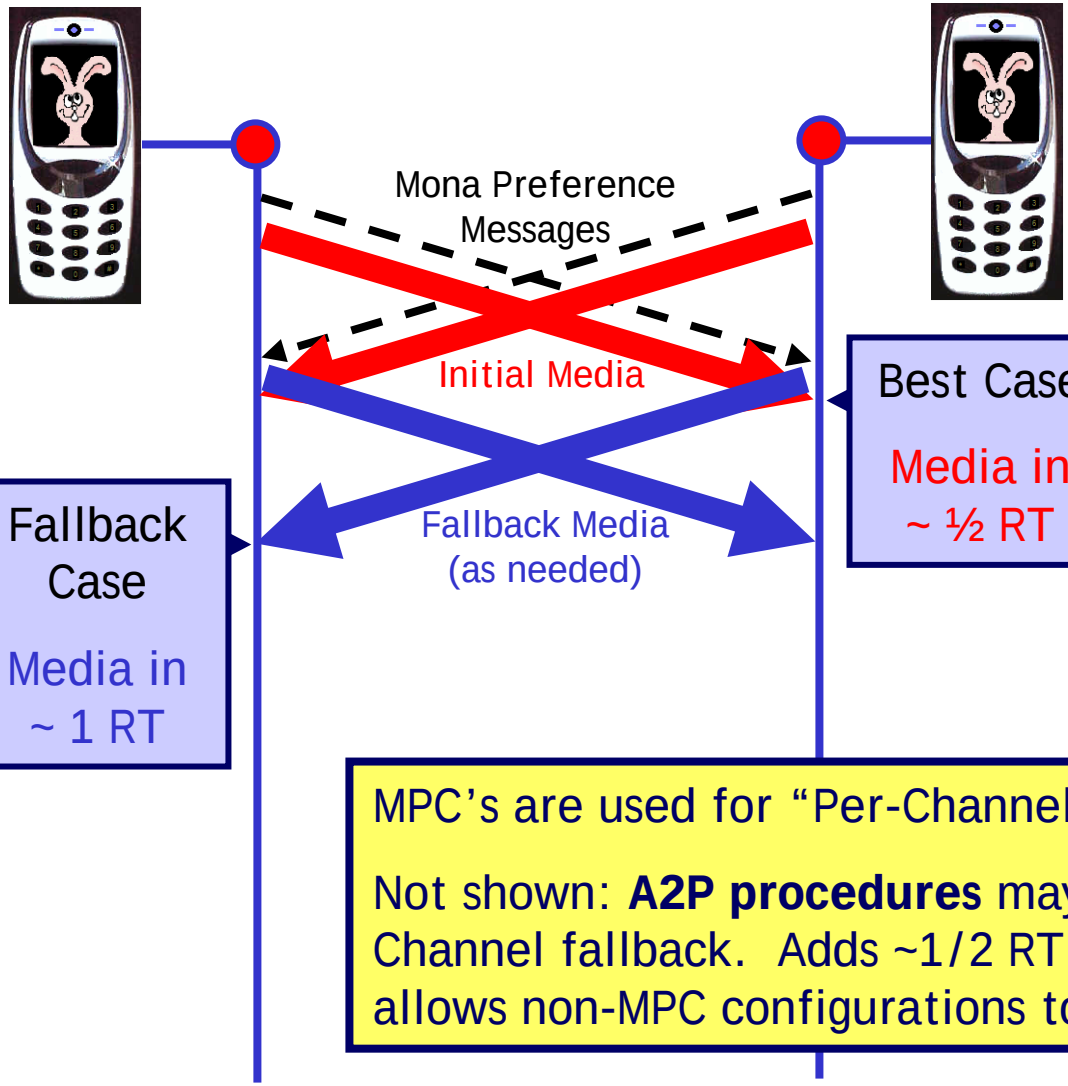
- May include SPC signaling, if supported
- May include MPC media, if supported
- May include a combination of SPC/MPC

What happens next depends on preferences of specific terminals

We'll explore some typical scenarios…

How it works: MONA meets MONA

ITU-T



Scenario #1:

Terminals agree on MPC

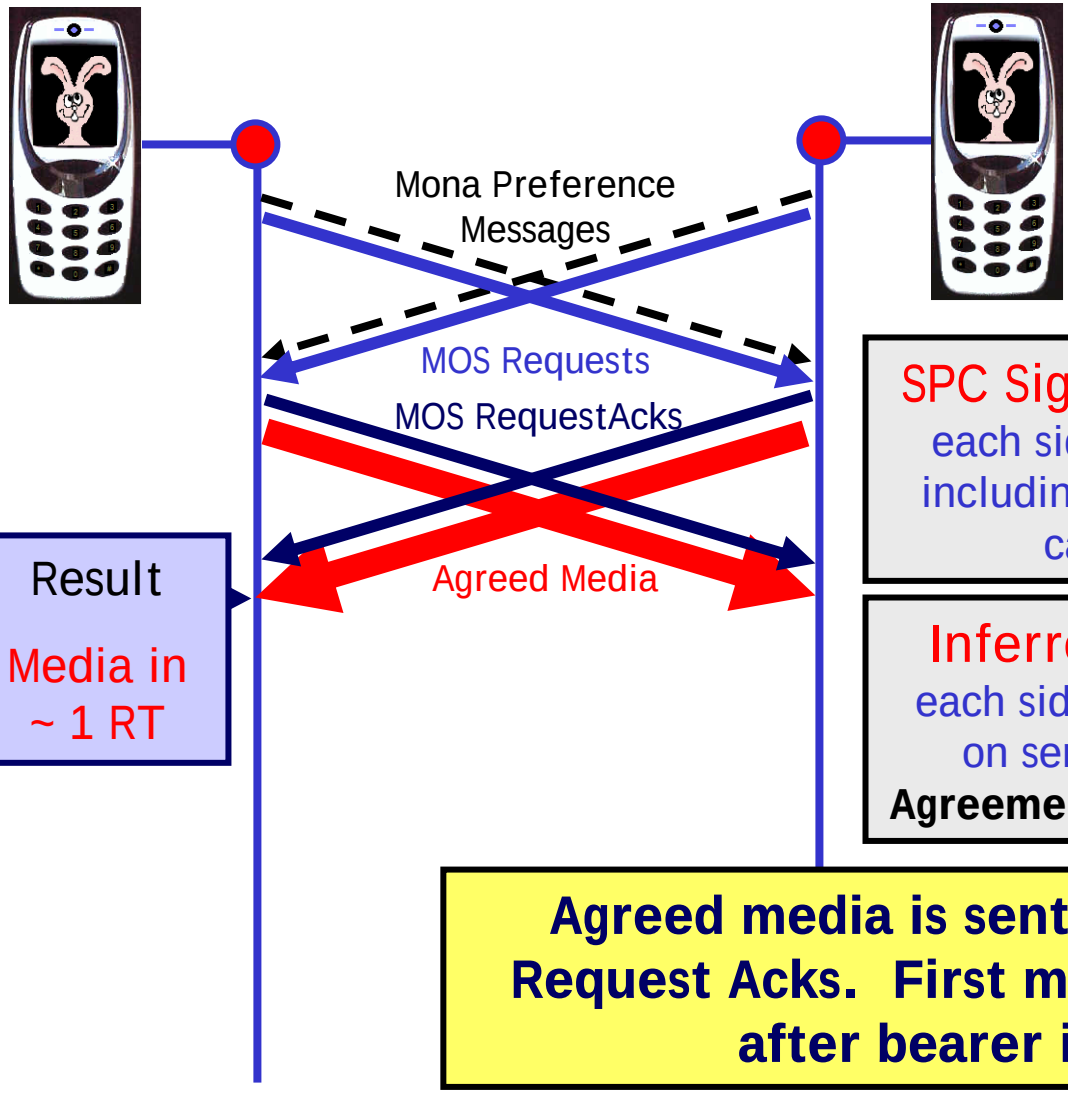
Media sent on "early bearer" e.g. each side might transmit MPEG-4 visual + AMR-audio from the start, using MPC default configurations

MPC's are used for "Per-Channel" fallback in the figure

Not shown: **A2P procedures** may also be used for Per-Channel fallback. Adds ~1/2 RT (for TCS+MSD) but allows non-MPC configurations to be used

How it works: MONA meets MONA

ITU-T



Scenario #2:

Terminals agree on SPC

SPC Signaling on "early bearer"
each side transmits "MOS Requests" including a **mediaProfile** (an array of candidate OLC requests)

Inferred Common Mode (ICM)
each side runs an inference algorithm on sent/received mediaProfiles – **Agreement is reached on media modes**

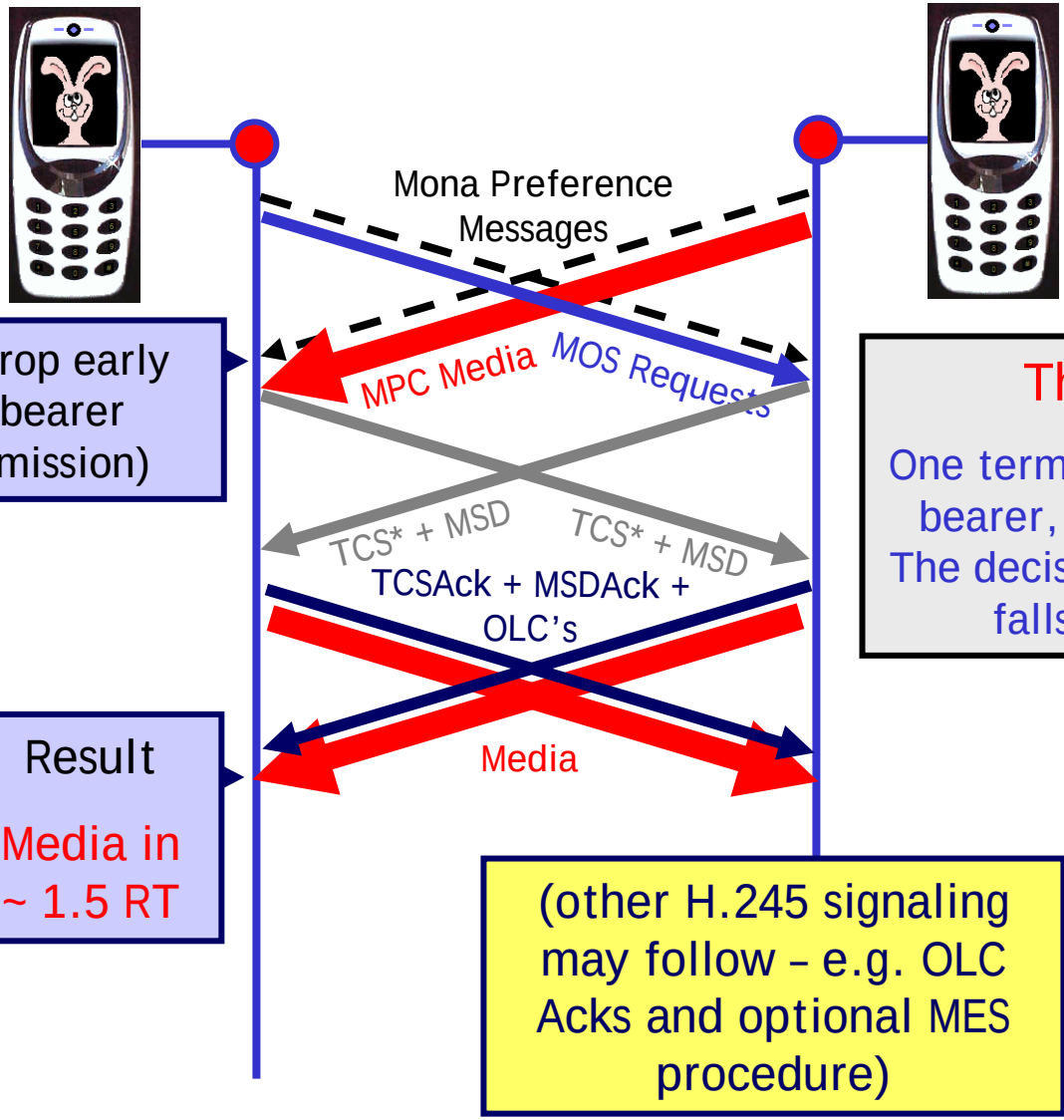
Result

Media in ~ 1 RT

Agreed media is sent in parallel with MOS Request Acks. First media is received ~1 RT after bearer is established

How it works: MONA meets MONA

ITU-T



Scenario #3:

Terminals agree on A2P

(Drop early bearer xmission)

The typical scenario:

One terminal supports only SPC on early bearer, the other supports only MPC. The decision algorithm defined in MONA falls back to A2P in this case.

Result

Media in ~ 1.5 RT

(other H.245 signaling may follow – e.g. OLC Acks and optional MES procedure)

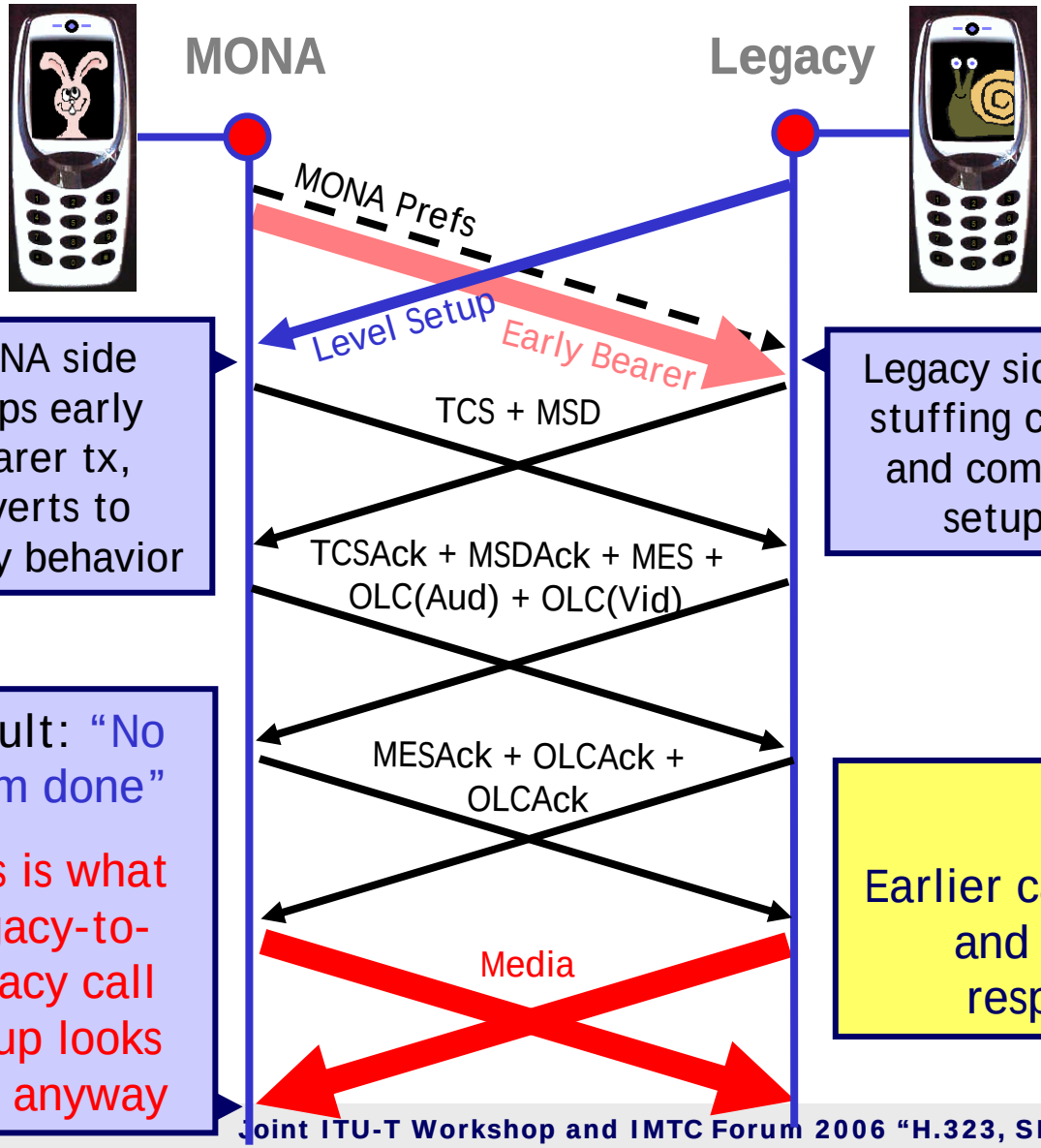
ITU-T

Notes on MONA vs. MONA scenarios

- MONA combination preserves performance of each contributing proposal
- Expected MONA performance
  - Constrained media in ½ RT (MPC)
  - Flexibly negotiated media in 1 RT (SPC)
  - These are the best numbers any method could achieve (using bearer only)
- Call setup <1 second is typically achieved
  - This was the goal

How it works: MONA meets Legacy

ITU-T



MONA side drops early bearer tx, reverts to legacy behavior

Legacy side detects standard stuffing component (Level2) and completes H.223 level setup "on schedule"

Result: "No harm done"

This is what legacy-to-legacy call setup looks like anyway

Important note:

Earlier caveats still apply (slide 7), and in particular the NSRP responses are not shown!

Expected Performance

- MONA-to-MONA case
  - Time to receive media ranges 0.5 to 1.5 RT
  - "Typical" RT = 800 mS
  - So call setup may range 400mS to 1.2 sec
- Real testing?
  - No test results on MONA combination -- yet
  - All component technologies have been tested and shown to set up calls in ~1 second or less
  - It's not all protocol – some implementation specific contributing factors

ITU-T

Remaining Work

- ITU-T
  - MONA drafted at April SG16 meeting
  - Structured as new H.324 Annex K (optional)
  - WP2 will meet in June to consent the draft
- 3GPP
  - First discussion on MONA will be at SA4#39 in Dallas
  - MONA is likely candidate to satisfy related Rel-7 work item on 3G-324m call setup acceleration
  - Could do additional specification or profiling
- IMTC
  - 3G-324M AG is the place for open MONA testing

ITU-T

Conclusion

- MONA unites under a common framework several excellent technologies for H.324 call setup acceleration
- MONA preserves the benefits and performance of the component technologies
- MONA solves the 3G-324m call setup time issue

ITU-T

Thank you!