Networking Infrastructure for IC&V Collaboration

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Outline:

- **Testbed networks**
- **Collaboration Protocols**
- **Goals**

Testbed Networks for Collaborative Infrastructure

Internet

- congested, but real users.
- evolving slowly (RED, WFQ, RSVP)

MBone

- evolving slowly into native IP multicast support

MICE/MERCI

- supplimental MBone over ATM

Private ISDN

CAIRN

- testbed for network infrastructure and applications

ESnet

- CBQ experiments, DOE 2000

vBNS

NASA NREN

Internet 2

Supernet

Many Different Testbeds

These testbeds are complimentary, but only if application designers have *heterogeneity* in mind.

Collaboration Protocols (Today)

RTP/RTCP

proposed standard for audio/video transport

PIM-SM v2

scalable (?) mulicast routing

RSVP

resource reservations

Controlled Load Service, Guaranteed Service

new models for internet service in addition to best effort

SDP

Session Description Protocol for announcing sessions

H.323

tightly coupled conference control, ugly

CORBA,

limit use of...

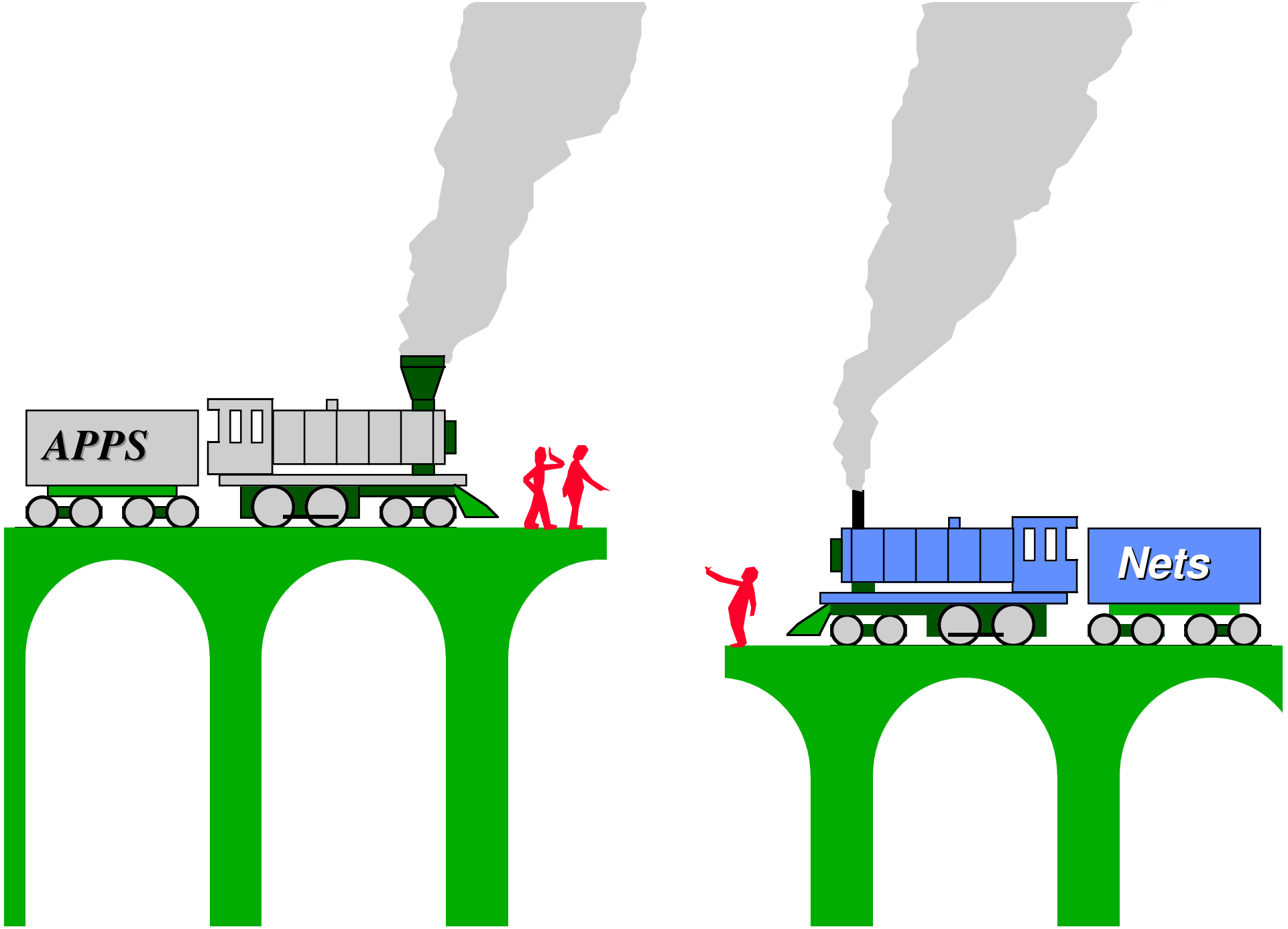
Collaboration Protocols (missing pieces)

Reliable Multicast

- not a solved problem
- candidates available (SRM, etc)
- congestion control unsolved

Multicast Protocols for VR, shared tools, etc

- mismatch between application designers expectations and the realities of heterogeneous networks.
- design for inconsistency
- reliability <-> performance tradeoffs
- only then tailor the infrastructure to the applications!


APPS
Nets

Goals

- **Use open standards + emphasize interoperability**
- **Manage rather than deny heterogeneity**
- **Design for failure, engineer for success**
- **Use testbeds for experimentation but aim for ubiquitous usage.**