

AG Retreat 2004 Individual Presentation
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Design of Network-adaptive Extended Video Services for Access Grid

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Motivation

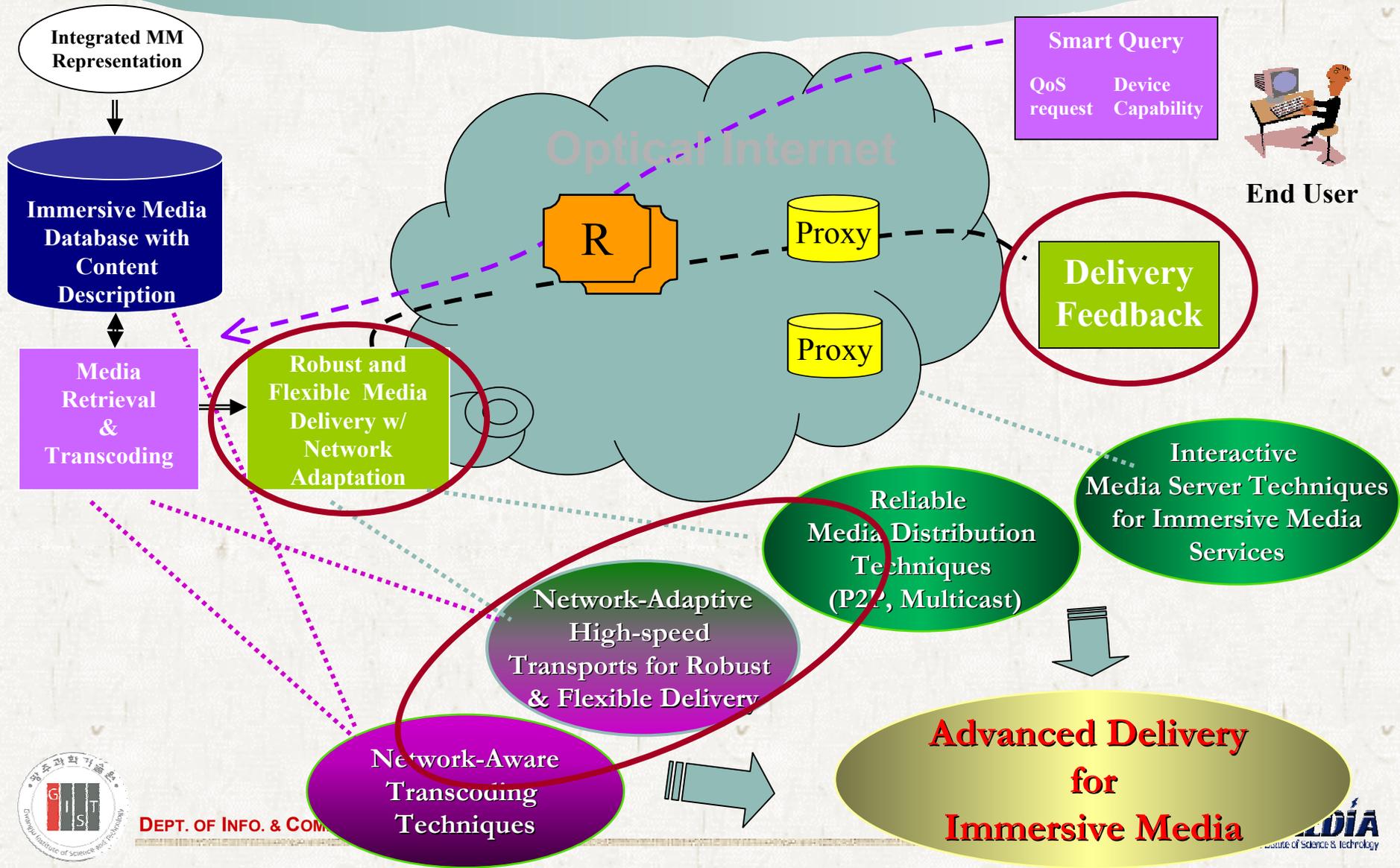
High-quality video services for Access Grid Toolkit to promote advanced collaboration environment

- Limitation of current Access Grid Toolkit (2.1.x): Low-resolution VIC-based video (300Kbps CIF sized image) only
- Gbps-range R&E Networks enables bandwidth-demanding high-quality media service (DV and HDV quality).
 - DV (digital video): around 30Mbps 720x480 DV encoding
 - HDV (high-definition digital video): 19.2Mbps MPEG-2 TS encoded 1280x720 30progressive (JVC HDV Camcorder)

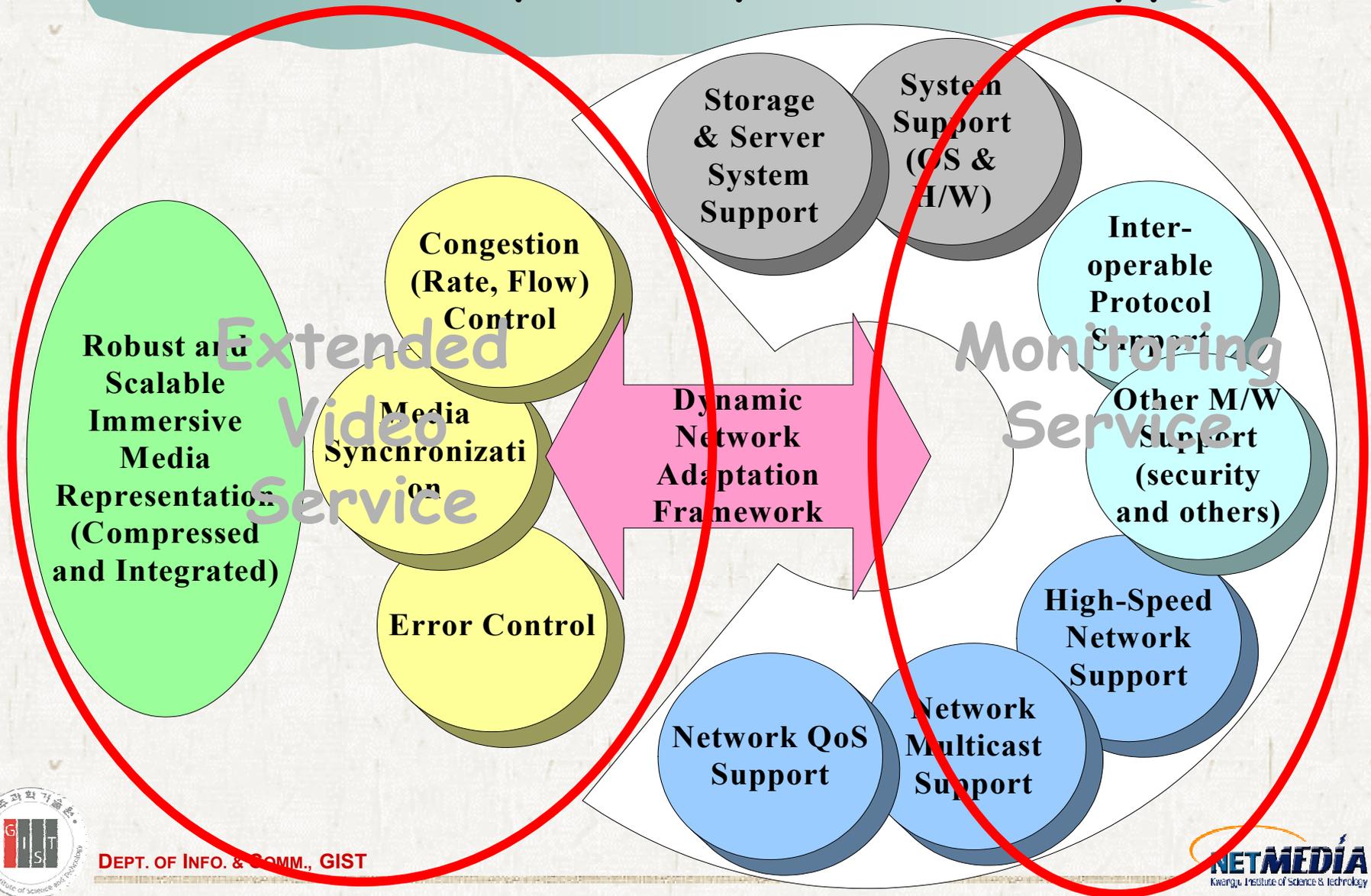
High-quality video services for AG need more supports.

- ExtendedVideoServices: Flexible multicast address, Unified video program interfaces, ...
- Monitoring Services: To monitor and guide network-adaptive delivery of media streams

Toward Immersive Media Delivery

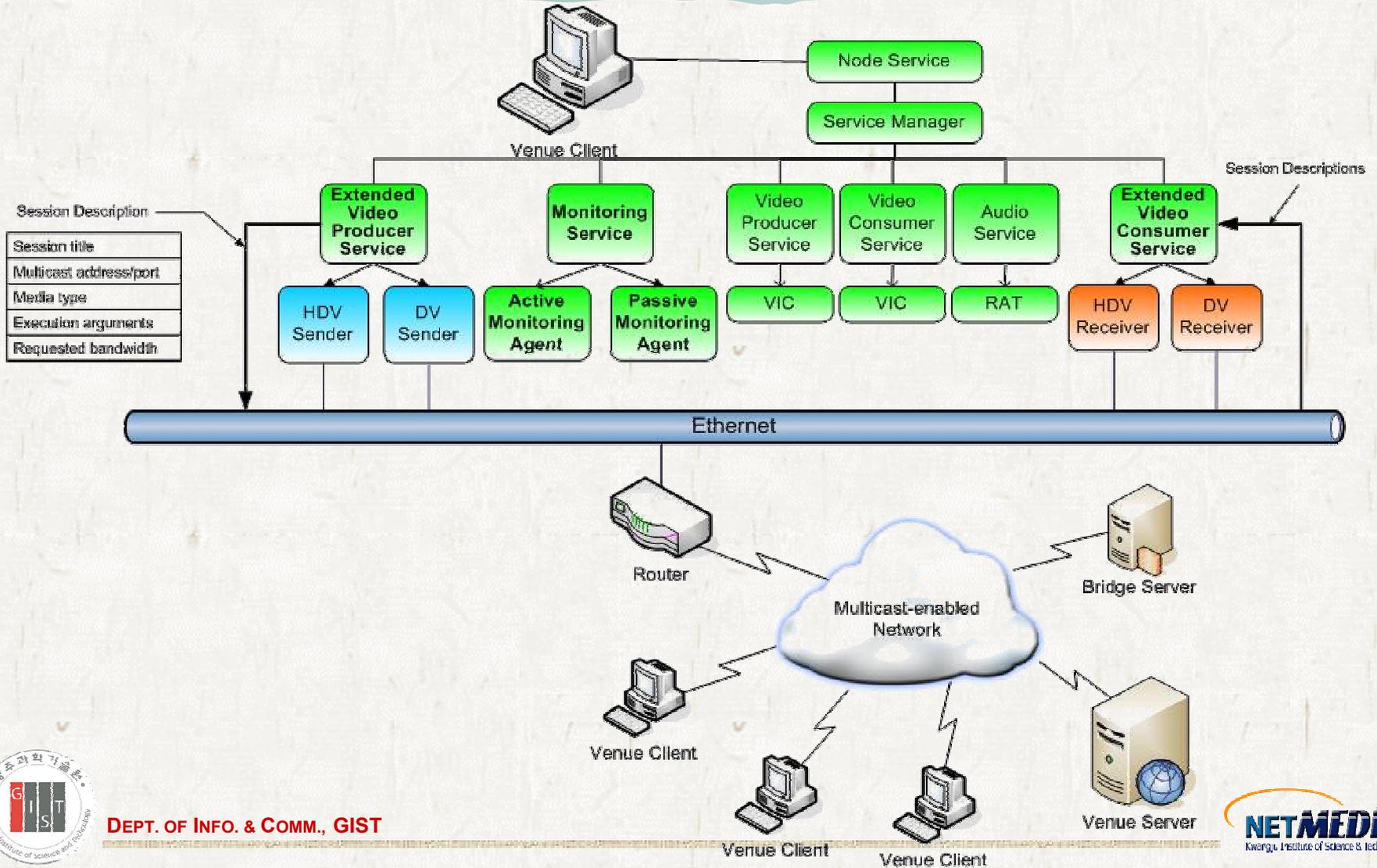


Media Delivery - Adaptation & Support



Network-adaptive Video Services for AG

- Extended Video Services & Monitoring Service -



Main Components

Versatile video supports for AG (including high-quality video): **Extended Video{Producer, Consumer} Services**

- Unified video program interfaces for AG
- Flexible multicast address allocation and management

Check our AGR 2004 showcase presentation titled as “High-quality Video Service Demonstration for Access Grid”

Support Network-adaptation of AG media services: **Monitoring Service** (with Control Coordination?)

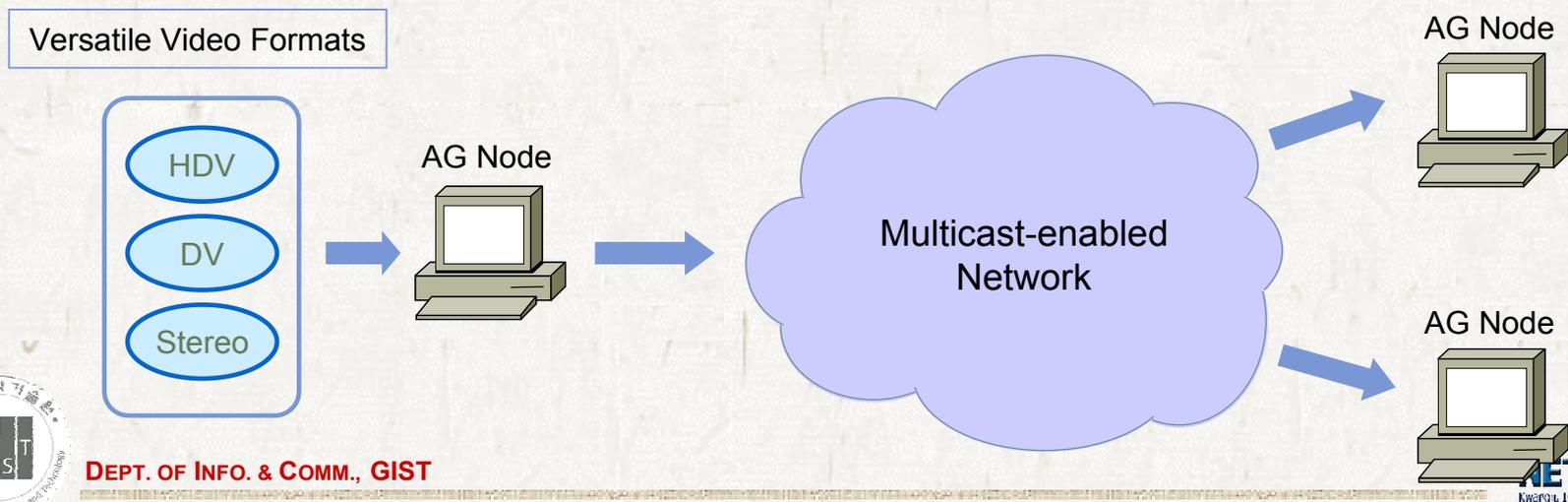
- Hybrid monitoring to check both network & system status
 - Passive (RTCP and system) and Active (Multicast Beacon)
- Monitored status will guide the required network adaptation
 - Needs network-adaptive media services
 - Will coordinate the adaptation based on the given policy

Versatile Video Support for AG

Unified Video Program Interface

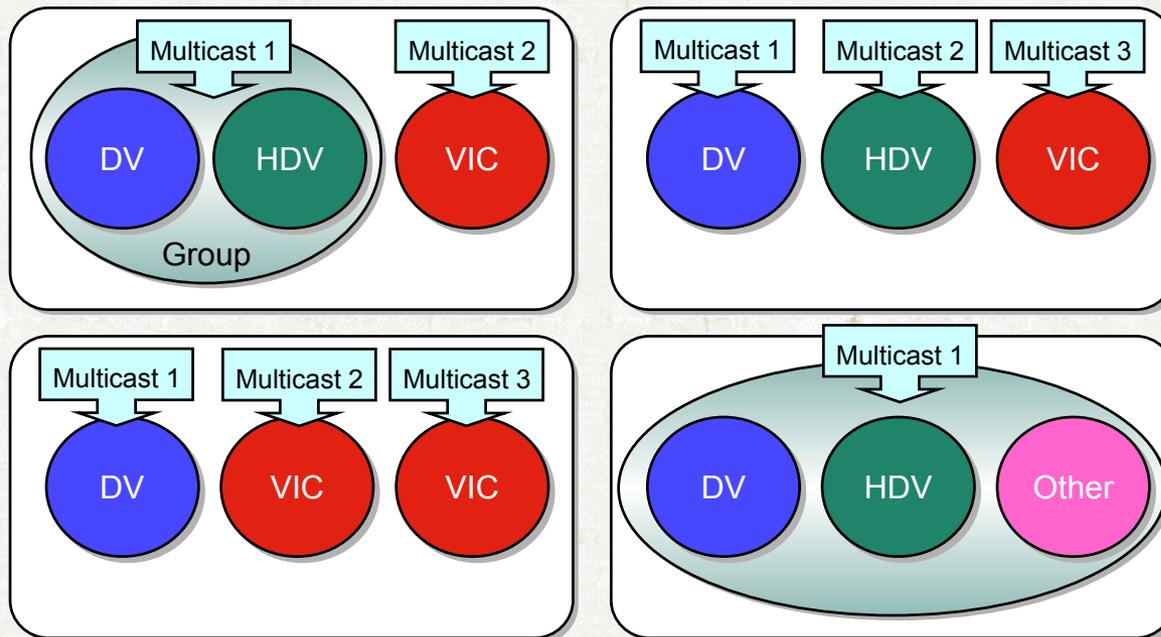
Enable AGTk to support various video programs and formats with unified interfaces

- Level 0: basic inter-working with AGTk
- Level 1: + network-adaptation capability (self, AG-coordinated)
- Level 2: + A/V synchronization with speaking node identification

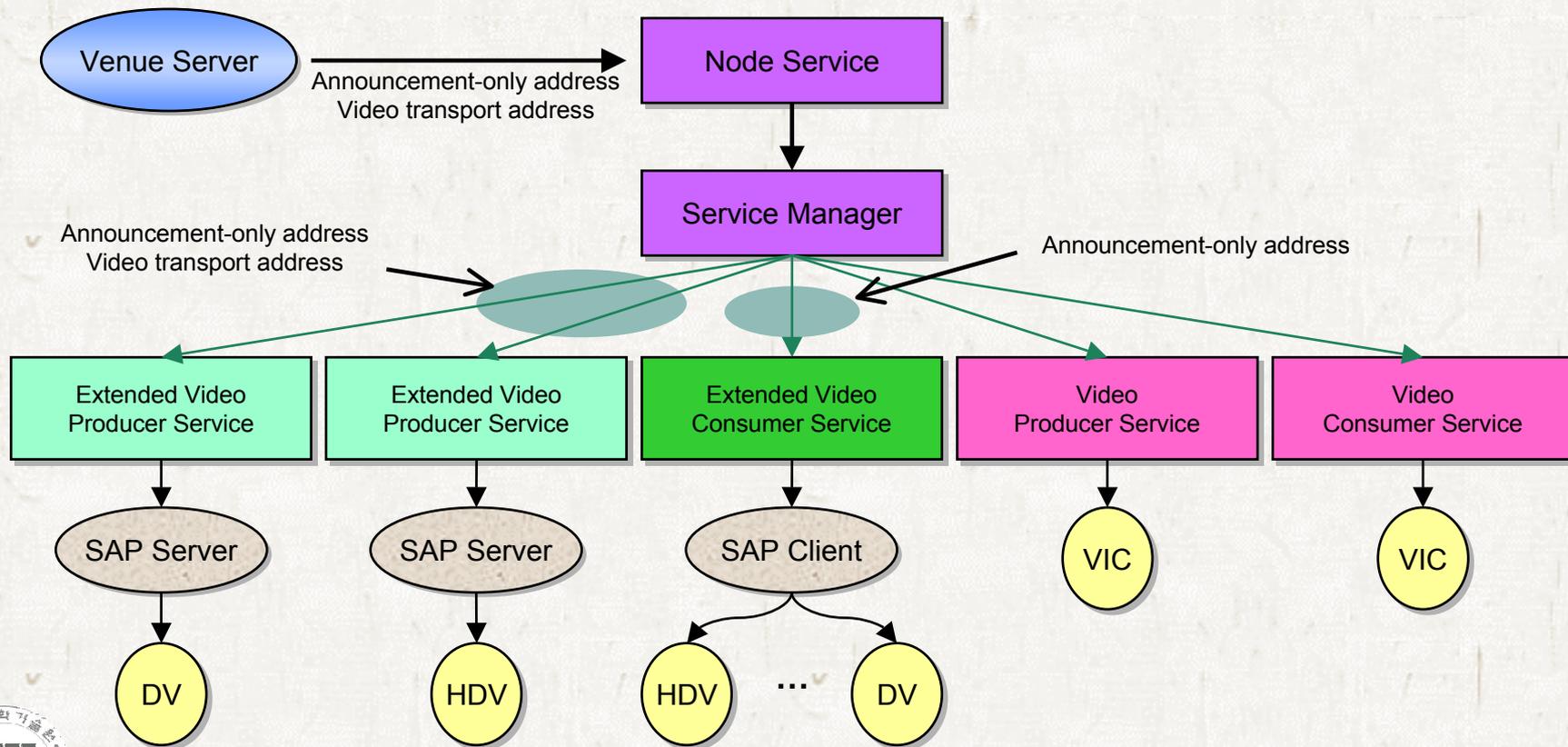


Flexible Multicast Address Allocation & Management

- A unique multicast address per each group of video producer services
 - Various types of address allocation support
 - Possible to manage separate policy for each group



Extended Video Services



Comparison of HDV, DV, VIC



HDV (1280x720)
around 20Mbps



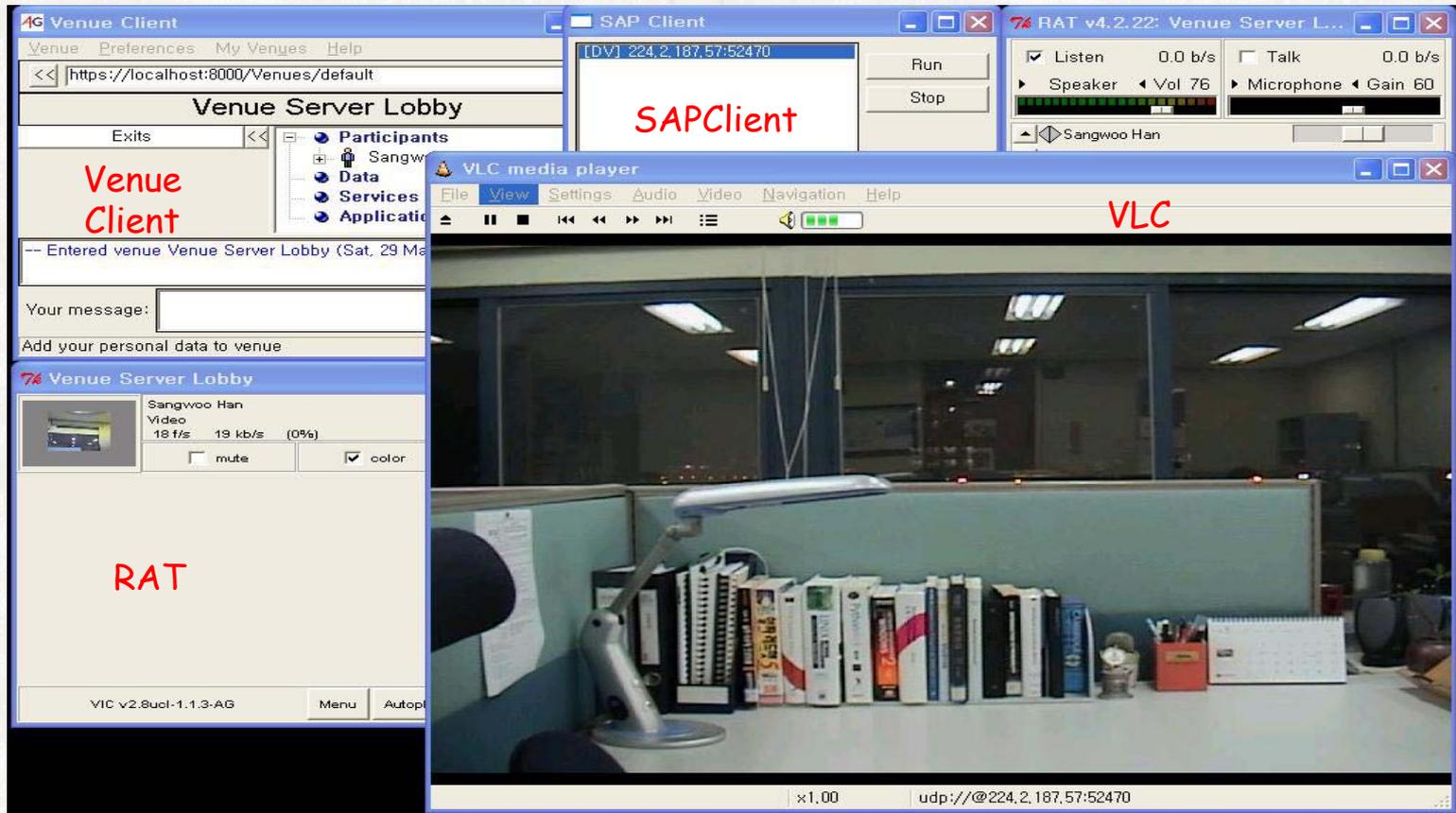
DV (720x480)
around 30Mbps



VIC (352x240)
around 300kbps

Prototype implementation for Extended Video Services (2004)

Linking HDV/DV to AG (with python based implementation)



AGR 2004 Showcase Demonstration

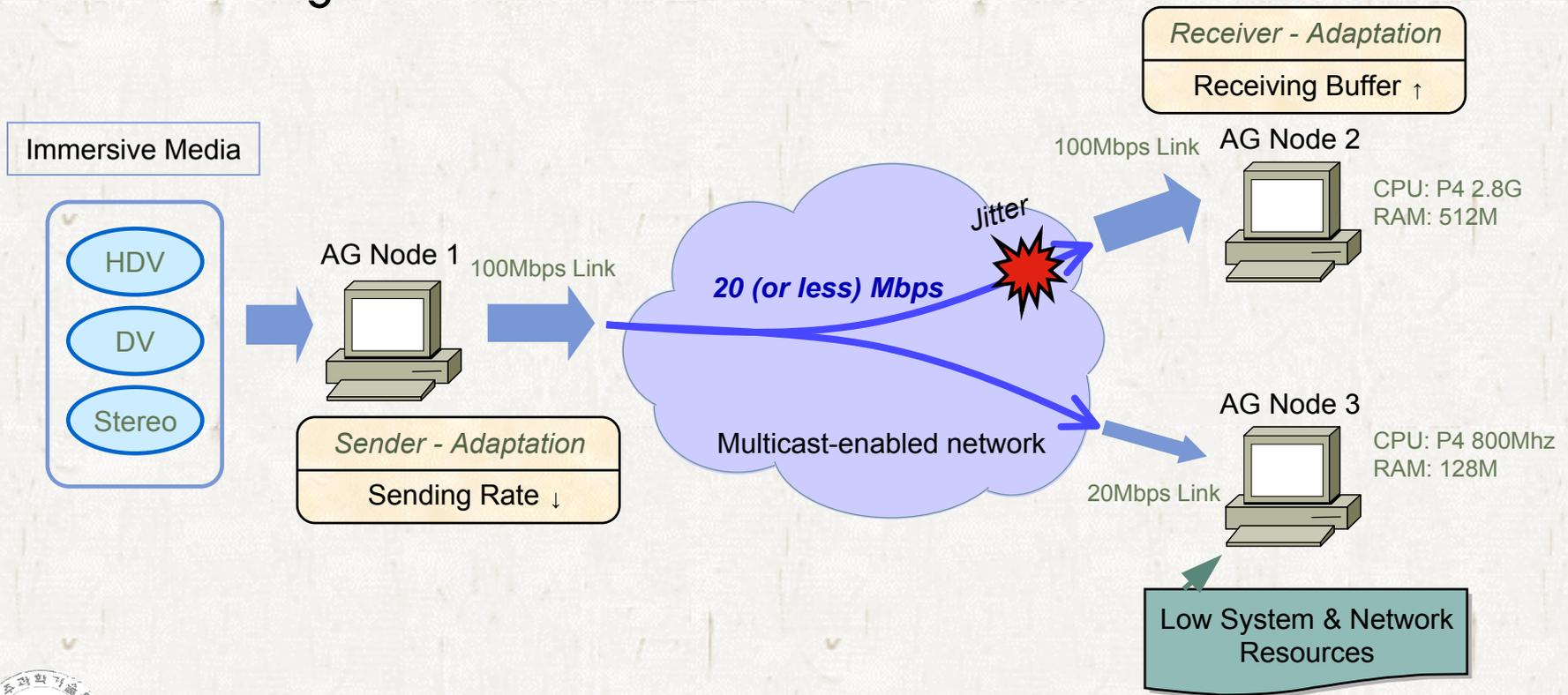


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Support Network-adaptation of AG

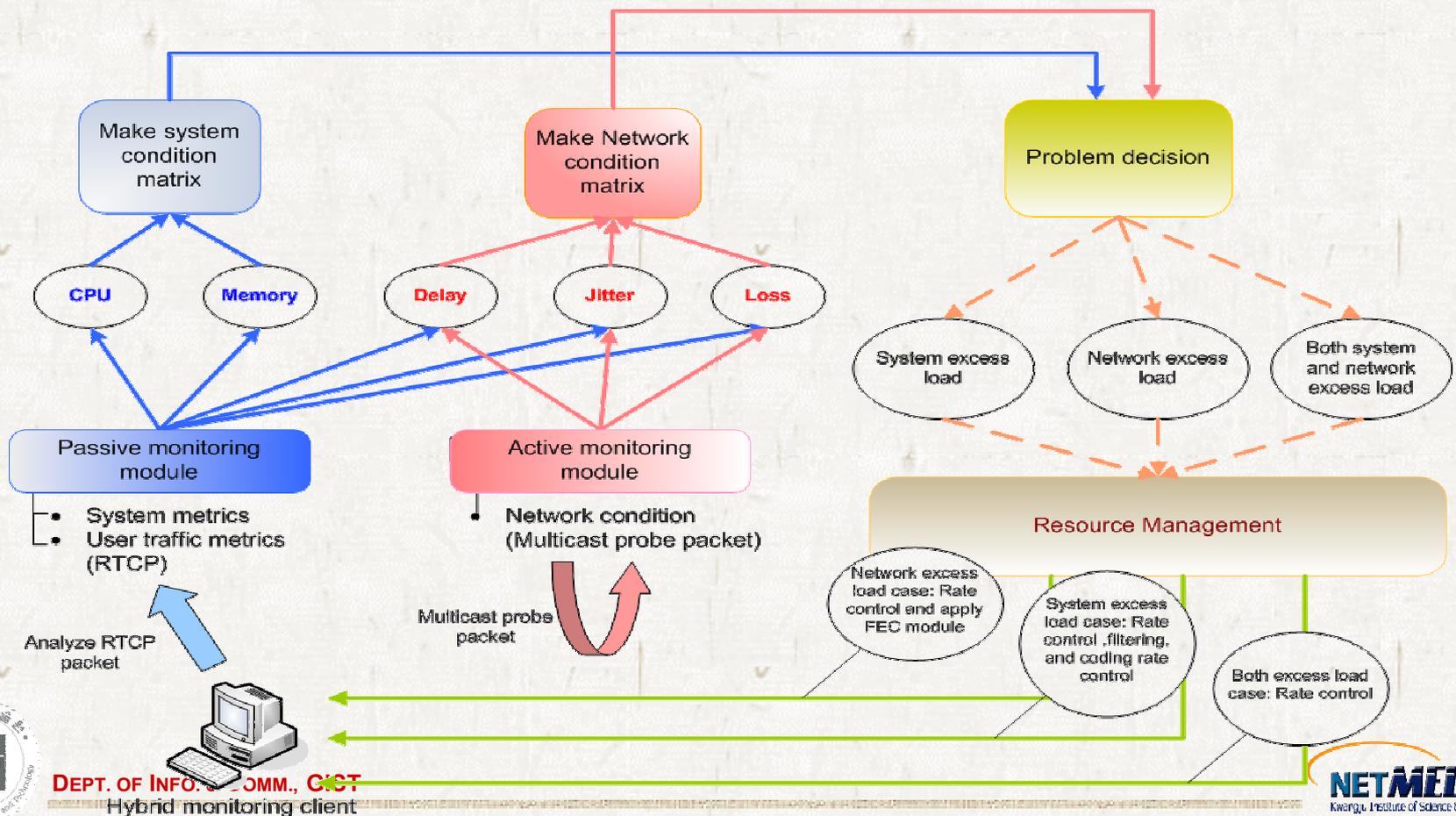
Network-adaptive video delivery based on network & system monitoring feedback



Hybrid Monitoring Scheme

Hybrid monitoring to check both network & system status

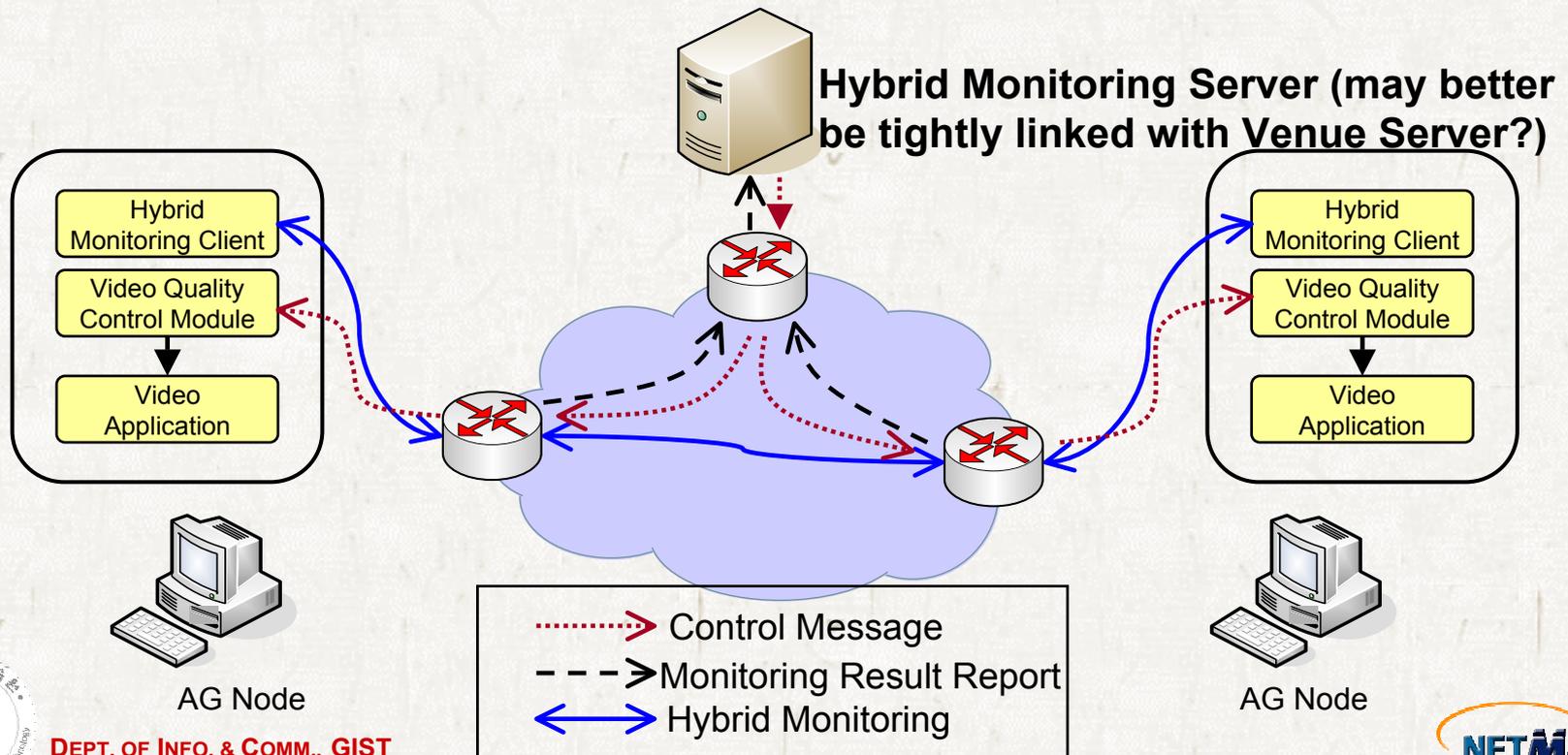
Passive (RTCP and system) and Active (Multicast Beacon)



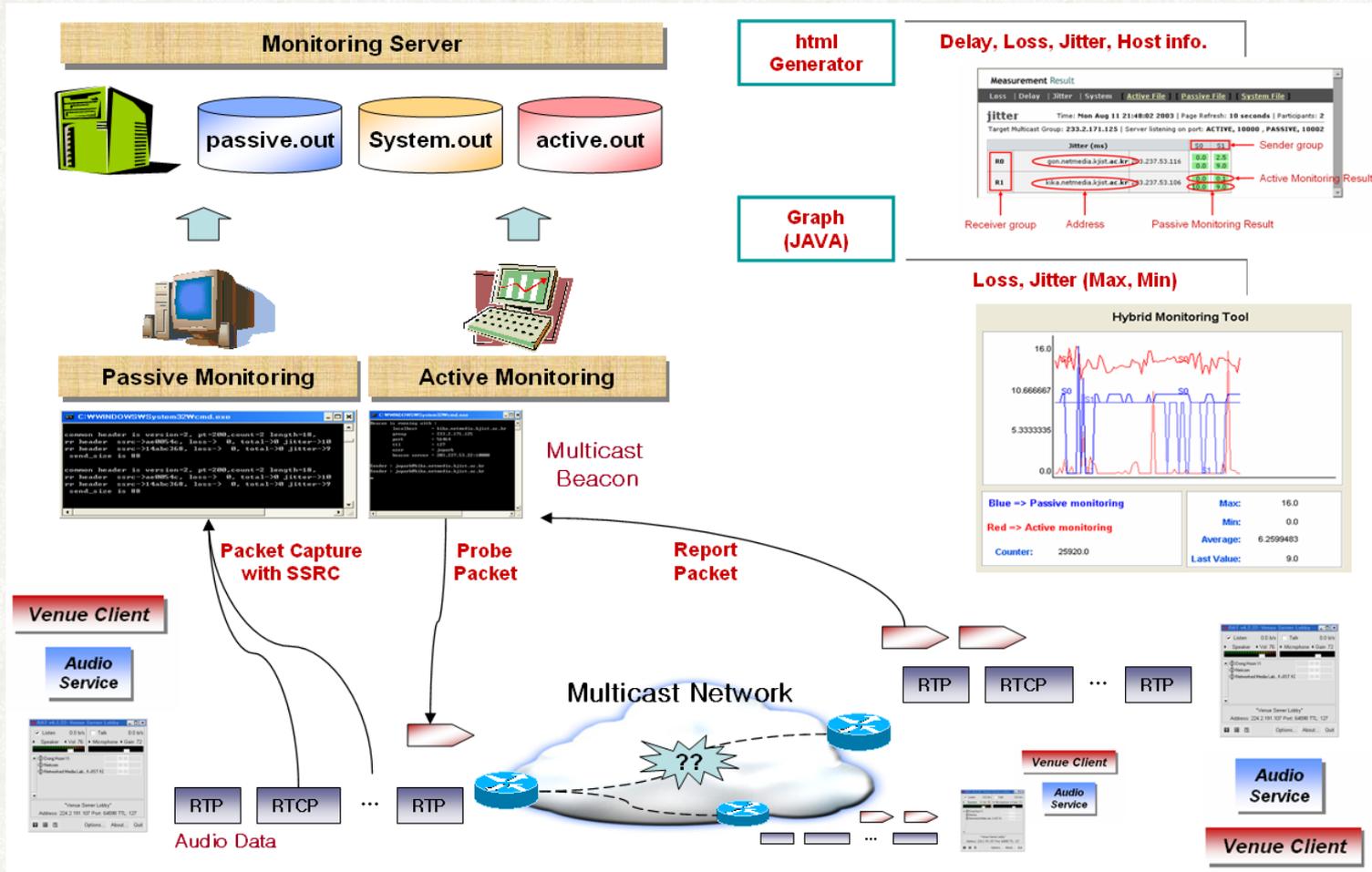
Coordinating Network-adaptation based on Monitoring Feedback

Monitoring will guide the required network adaptation

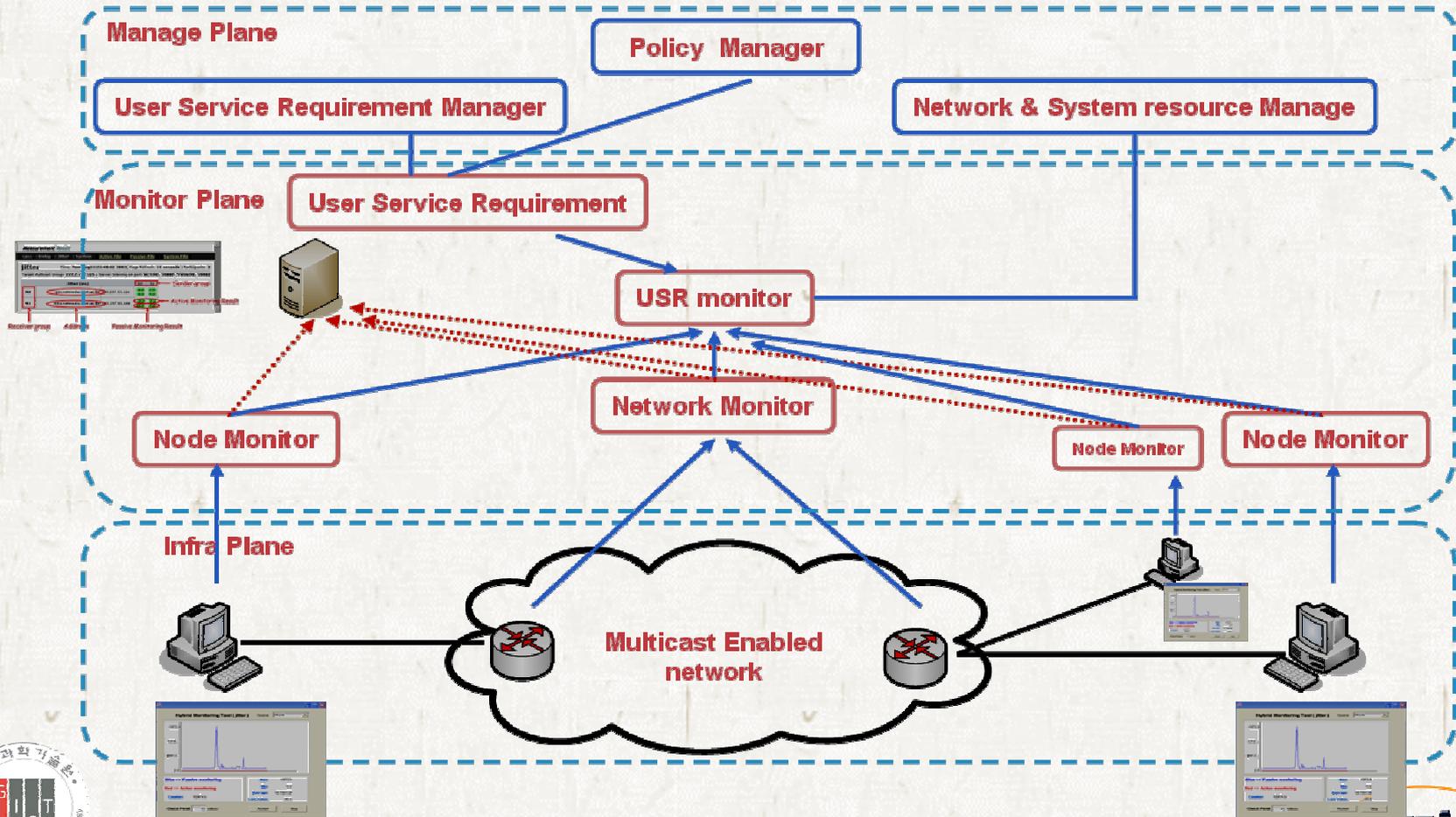
- Needs network-adaptive media services (self & AG-coordinated)
- Will coordinate the adaptation based on the given policy



Partial (on-going) implementation for Hybrid Monitoring Scheme (2003-2004)



Toward Policy-based Network-adaptation with Monitoring Service



Conclusion and Future Works

- ❑ Aims to enable AG to support various media (mostly video) programs and formats with different QoS requirement over (partially) heterogeneous networks and AG node systems.
- ❑ Needs to be refined further to reflect more aspects of AG media services while simplifying it for feasibility.



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Thank you!

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