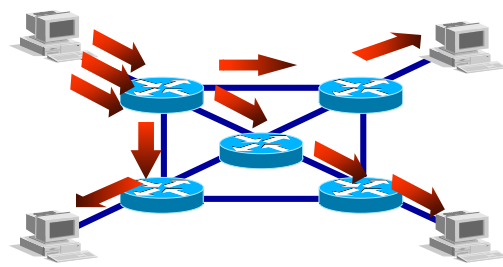
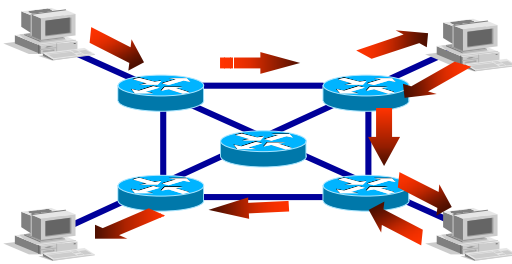


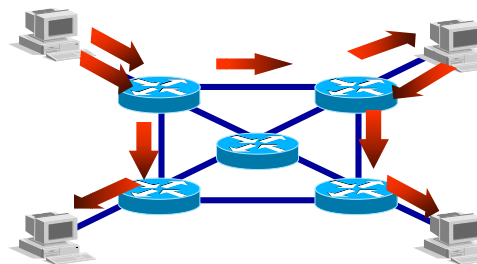
(a) multicast



(b) replicated unicast



(c) overlay multicast - case1



(d) overlay multicast - case2

( 1) , ,

( 1) ,

(c) (d)

(a)가

가

, (b)

N

N

가

(Internet Service Provider)

가

가

(Overlay Multicast)

가

가

,  
가

Ad-hoc

---

## II.

### 1.

/ (Reflector) (tunneling)  
가  
(User-level)

(datagram)

가 . UMTP[3] Mtunnel[4]  
(setup)가 , 가

### 2. (Overlay Multicast)

Narada[5-6]

Narada 가 (Reverse Path Forwarding)

가

가

가

(forwarding)

가

(dedicated server)가

(border router)가

가 가

(directed virtual graph)가

(metric)

(rendezvous point)[7]

(source)

, HBM[7]

가

가

RP

III

3.

가

가

multiCAST)[8] DCM(Distributed Core Multicast)[9]가 XCAST(exPLICIT)

XCAST XCAST (IPv4) (IPv6)

IP 가

XCAST (state information) 가

DCM 가 , DCM

(edge)

(DCR)

DCR , DCR

가

(multihop) Ad-hoc

AMRoute[10], ODMRP[11], MAODV[12]

가

Ad-hoc

### III.

ALMI[13], Narada[5-6], Scatter

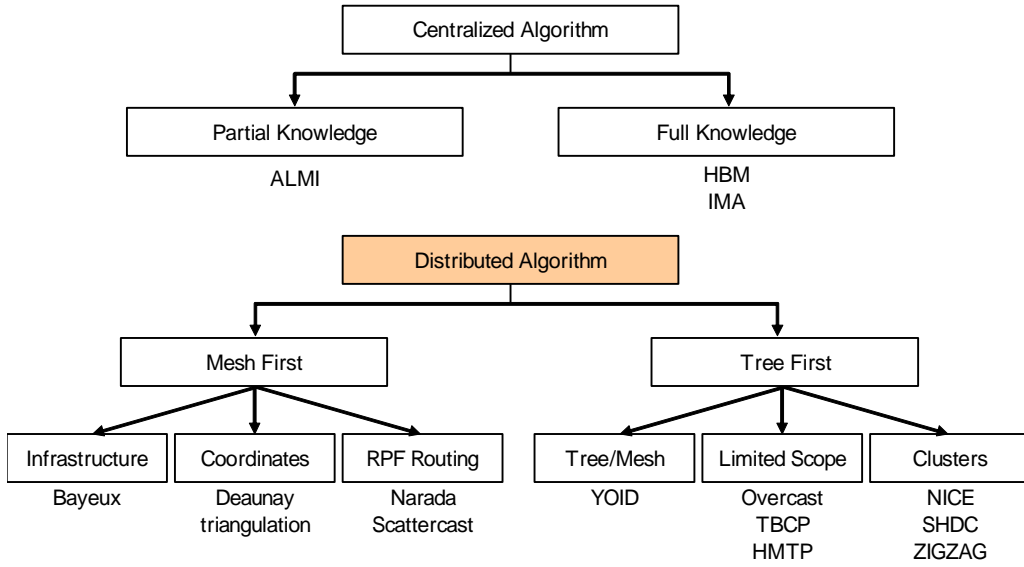
Cast[14], TBCP[15], NICE[16], Yoid[17] . ( 2)

(Centralized) (Distributed)

/

, Narada ALMI

, RMX[18]



( 2 )

가

1.

가

가

가

II

HBM[7] ,

ALMI[13]

ALMI

(Plug-in)

. ALMI

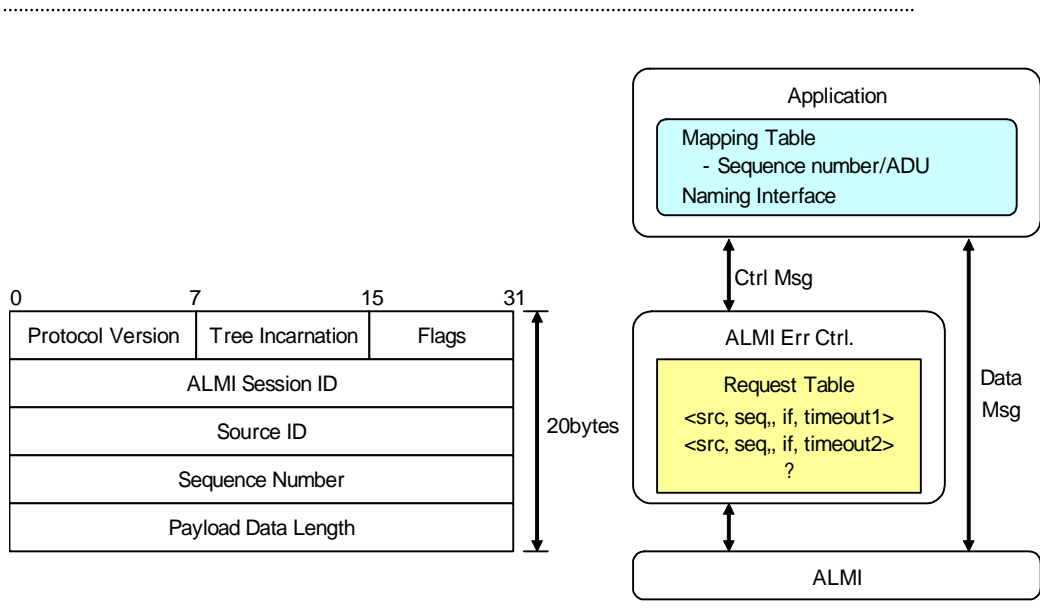
“ (degree-bounded optimal spanning tree)”

가

가

JavaTM

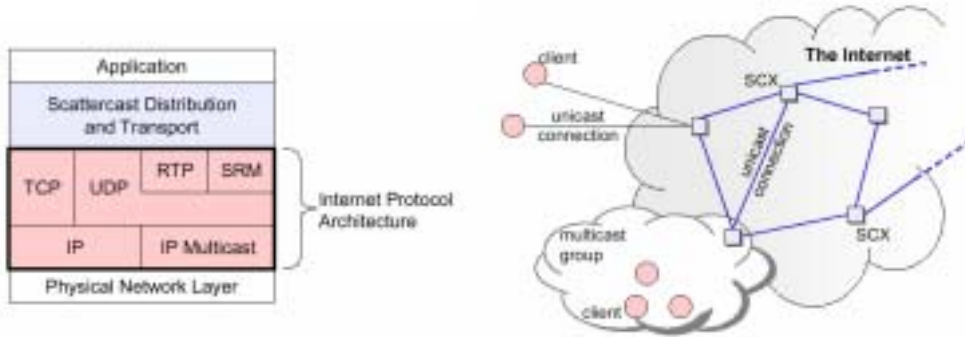
. ( 3 ) ALMI



( 3) AMLI

2.

Narada[5-6], Scattercast[14], Bayeux[21],  
 Delaunay triangulation[22] Narada[5-6] 가  
 Narada  
 가 , 가  
 Scattercast[14] RMX[18]  
 가  
 ( 4) Scattercast



( 4) ScatterCast

Yoid[17], Overcast[20], TBCP[15], HMTP[19],  
 NICE[16], ZIGZAG[23] , TBCP HMTP  
 가 ,  
 (top-down)  
 . NICE, ZIGZAG

Yoid[11]

(robustness)

( 5) Yoid

Yoid YTMP(Yoid Tree Management Protocol), YDP(Yoid Distribution Protocol), YIDP  
 (Yoid Identification Protocol) , Yallcast  
 가 .  
 TBCP[9] HMTP[13]  
 , 가 가 가  
 가 가  
 가 가  
 HMTP 가  
 ( 6)  
 가







2000, pp.1-12.

- [6] Y. Chu, S. G. Rao, S. Seshan, and H. Zhang, "Enabling Conferencing Applications on the Internet using on Overlay Multicast Architecture," ACM SIGCOMM'01, Aug. 2001, pp.55-67.
- [7] V. Roca and A. El-sayed, "A host-based Multicast(hbm) Solution for Group Communications," 1st IEEE International Conference on Networking, Colmar, France, July 2001.
- [8] R. Boivie et al., "Explicit Multicast(Xcast) Basic Specification," work in progress, draft-ooms-xcast-basic-spec-03.txt, Jun. 2002.
- [9] L. Blazevic and J.Y. Le Boudec, "Distributed Core Multicast(dcm): A Multicast Routing Protocol for Many Groups with Few Receivers," ACM SIGCOMM Computer Communications, Rev., Vol.29, No.5, Oct. 1999.
- [10] M. Liu, R. Talpade, and A. McAuley, "Amroute: Adhoc Multicast Routing Protocol," Technical Report TR 99-8, CSHCN, 1999.
- [11] S-J Lee, W. Su, and M Gerla, "ON-Demand Multicast Routing Protocol(ODMRP) for Ad Hoc Networks," work in progress, draft-ietf-manet-odmrp-01.txt, Jun. 1999.
- [12] E. Royer and C. Perkins, "Multicast Operation of the Ad-Hoc On-Demand Distance Vector Routing Protocol," MobiCom '99, Seattle, WA, Aug. 1999.
- [13] D. Pendarakis, S. Shi, D. Verma, and M. Waldvogel, "ALMI: An Application Level Multicast Infrastructure," 3rd UNIX Symposium International Technique and System 2001, Mar. 2001, pp.49-60.
- [14] Y. Chawathe, "Scattercast: An Architecture for Internet Broadcast Distribution as an Infrastructure Service," Ph.D. Thesis, University of California, Berkeley, Dec. 2000.
- [15] L. Mathy, R. Canonico, and D. Hutchison "An Overlay Tree Building Control Protocol," NGC2001, Nov. 2001.
- [16] S. Banerjee, B. Bhattacharjee, and C. Kommareddy, "Scalable Application Layer Multicast," ACM SIGCOMM'02, Aug. 2002, pp.205-217.
- [17] P. Francis, "Yoid: Extending the Internet Multicast Architecture," Technical Report, ACIRI, Apr. 2000.
- [18] Y. Chawathe, S. McCanne, and E. A. Brewer, "RMX: Reliable Multicast for Heterogeneous Networks," IEEE INFOCOM'00, Jun. 2000, pp.795-804.
- [19] B. Zhang, S. Jamin, and L. Zhang, "Host Multicast: A Framework for Delivering Multicast to End Users," IEEE INFOCOM'02, Jun. 2002.
- [20] J. Jannotti et al., "Overcast: Reliable Multicasting with an Overlay Network," USENIX OSDI, Oct. 2000.
- [21] S. Zhuang et al, "Bayeux: An Architecture for Scalable and Fault-Tolerant Wide-Area Data Dissemination," 11th International Workshop on Network and Operation System Support for Digital Audio and Video, June 2001.
- [22] J. Liebeherr, M. Hahas, and W. Si, "Application-Layer Multicast with Delaunay Triangulations," IEEE GLOBECOM '01, Nov. 2001.
- [23] D. Tran, K. Hua, and T. Do, "ZIGZAG: An Efficient Peer-to-Peer Scheme for Media Streaming," Univ. Central FL, Orlando, Technical Report CS-UCF 2002, 2002.