Technical Trends and Development Direction of On-Demand Software Streaming

```
(W. CHoi)
 (S.J. Heo)
 (W.Y. Kim)
(J. Kim)
 (K.H. Nam)
 (M.J. Kim)
 (D.H. Song)
 (S.Y. Park)
                           os
                                가
                           РС
                                                         가
           가
                                가
                                                                          가
                                       VOD(Video On Demand)
                                     가
                                                                                      가
                                                                                   os
  Evergreen
```

(on - demand soft ware streaming)

Operating System Local Disk

The streaming Server

RealNetworks, QuickTime, Microsoft Windows Media Player

(1)

가 .		II.			
	가				
, , .	,	Stream, Softr Theory	icity, Exent [4] - [7] [8].		App- es, Stream
,		1.			
가		가. AppStrear	n		
·		AppStream	[4]		가
AppStream, Softricity, Stream Thiory, Exent Technologies [4]-[7], , ,	°e -			. 1	AppStream
MS		(streamlet,	•		
가 . B2C)	가	НТ	
		SSTP(Softwa	re Streamin	g Transfer F	Protocol)
가			5~10	%	
1		,			가
,					,
가		,			
II , III		. Softricity		•	
, , IV . V		Softricity	[5] \$	SoftGrid	
VI .				SystemGu	ard

sandbox 가	,
, . SoftGrid 가 NET IT .	. (scalability) 가 , (load balancing) (fault- tolerant) . IBM, Microsoft, CA
. Stream Theory	. IBM
Stream Theory [6] STREAM IT MS	Microsoft, Sun Microsystems IT IT
STREAM IT	가 IBM IT
, ,	Tivoli Intelligent Orchestrator .
, , , , , , , , , , , , , , , , , , ,	, IT , , , , , , , , , , , , , , , , , ,
. Exent Technologies	SMS(System
Exent Technologies[7] EXEtender , (streaming mode)	Management Server) [1]. CA UnicenterTNG[9] . CA IT ,
가 . 가	
, "freeze"	2.
. , EXE-tender	[8]. Z!Stream 가

```
[13] - [15].
                                             . IBM
                         PC
                                             IBM
                                               가
                       (rich dient)
                                           가
                   MS WBT(Web-Based
                                            (page fault) 가
Terminal), Citrix Metaframe
           (NC)
                                                 [16].
(thin client)
               WBT
                          가
                                                , OS
                         Z!Stream
                                                                  [17],[18].
                                                                                  가
3.
                                                             [19]
가.
                                                     . Roman[20]
                                                                  . Mezini[21]
                              가
                                      가
                                                           3 가
                                 1999
                         [10]-[12].
 . AppStream
                                                      [22]
                 AppStream
            가
                                                              가
```

III.				• 가		
	가 가		IT 가			フ
•	,	,		•	, 가	
가 ,	, ,	,		• .NET Java	가 가 가	
•				·	,	기
				•	·	
•	,	, 가 .		·	, , 가	ΙΤ
•		. ,		가	·	,
					가	

가 가 가 IV. 가 가 IT 839 9 (workspace) 가 가 가 (가 IT ٧.

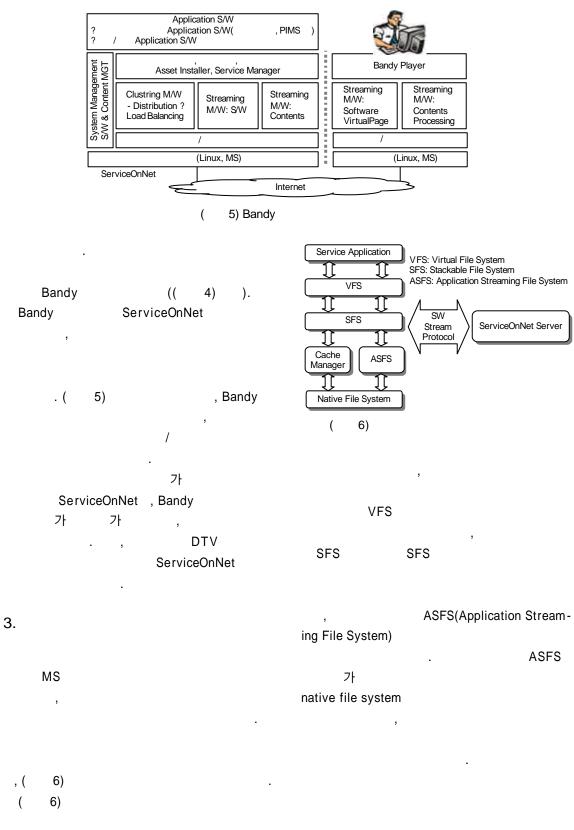
ServiceOnNet , Ser-가 viceOnNet 2) ServiceOnNet ServiceOnNet ServiceOnNet , (ServiceOnNet 가 ServiceOnNet 1. ServiceOnNet Bandy ServiceOnNet 가 , SoD (Software on Demand) VoD(Video on Demand) 가 Evergreen S/W, 2. Bandy S/W, ServiceOnNet Distribution 가 MS 2) ServiceOnNet os PC PDA ServiceOnNet ServiceOnNet Notebook Service OnNet Client Service istribution d Balancing orwarding; Bandi Player ServiceOnNet ServiceOnNet Client Streaming ___ Distribution

3) ServiceOnNet

(

GUI

4) Bandy



	, 가 가 ,	, 가	SOD + VOD ? ? ? ? ? ? (7)	
4. SoD/VoD				
			(7)	, SoD/VoD
,	,			가
·		가	,	
,	가 ,			
,			5. Evergreen	
,	가	·	가	가
가		,		Evergreen . Evergeen
•				90011

가 GUI 가 Evergreen . (8) 가 Evergreen 가 가 가 가 Evergreen MS MS , Adobe Photoshop , Evergreen , Evergreen 가 가 , GUI GUI SI ? word ? presentation... 6. 가 utility (Component Based Development: CBD) 8) Evergreen

(9) . 가 CBD 가 가 7. 가 가 가 가 500 가 가 SI 가 , 가 VI. 가 가 3~4 가 100Mbps 가 가 VOD 9)

- [1] Apple QuickTime, http://www.apple.com/quitcktime
- [2] RealNetworks, RealNetworks Document Library, http://service.real.com/help/library/index.html
- [3] Microsoft Windows Media Player, http://www.microsoft.com/windows/windowsmedia/indowsmedia/def ault aspx
- [4] AppStream, http://www.appstream.com
- [5] Softricity, Inc., http://www.softricity.com
- [6] Stream Theory, http://www.streamtheory
- [7] Exent Technologies, http://www.exent.com.
- [8] , http://www.softonnet.com
- [9] http://www3.ca.com/Files/SupportingPieces/uni_vision_wp.pdf
- [10] , , "

2000-0057127, 2000. 9.

[11] , , , , , , , ,

," 2002-0040535, 2002. 5.

- [12] Dong -Ho Song and Jai-Wan Ahn, "Software Rental System In Distributed Networks," EP Patent 1163599, 2001. 12.
- $\hbox{[13] D. Eylon, A. Ramon, Y. Volk, U. Raz, and S. Melamed,}\\$

- "Method and System for Executing Network Streamed Application," U.S. Patent 6,574,618, June 3, 2003.
- [14] D. Eylon, A. Ramon, Y. Volk, U. Raz, and S. Melamed, "Streaming Modules," U.S. Patent 6,311,221, Oct. 30, 2001
- [15] D. Eylon, A. Ramon, Y. Volk, U. Raz, and S. Melamed, "Method and System for Streaming Software Applications to a Client," U.S. Patent Application Publica tion US 2001/0037399, Nov. 1, 2001.
- [16] F.C. Breslau, RG. Greenstein, and JT. Rodell, "Method and System for On-Demand Software Distribution," U.S. Patent 5,765,205, June 9, 1998.
- [17] D.E. Jewett, "Multiprocessor System with Each Processor Executing the Same Instruction Sequence and Hierarchical Memory Providing on Demand Page Swapping," U.S. Patent 5,388,242, Feb. 7, 1995.
- [18] D.S. Domenikos and C.G. Domenikos, "Systems and Methods for Executing Application Programs from a Memory Device Linked to a Server at an Internet Site," U.S. Patent 6,240,442, May 29, 2001.
- [19] G.E. Silveira, "Spontaneous Software: A Webbased, Object Computing Paradiagm," ACM ICSE 2000, Limerick, Ireland, 2000, pp.719-721.
- [20] G.C. Roman, G.P. Picco, and A. Murphy, "Software Engineering for Mobility: A Road Map," ACM Future of Software Engineering, Limerick, Ireland, 2000, pp.243-258.
- [21] M. Mezini, and K. Ostermann, "Integrating Independent Components with On-Demand Remodularization," ACM OOPSLA 02, Seattle, WA, USA, Nov. 4-8, 2002, pp.52-67.
- [22] P. Kuacharoen, V.J. Monney, and V.K. Madisetti, "Software Streaming via Block Streaming," DATE 03 Conference, Munich, Germany, IEEE and ACM SIGDA, pp.912-917.